

US Army Corps of Engineers  
Kansas City District

Final Test Excavation Data Summary Report

Remedial Investigation/ Feasibility Study  
Raritan Bay Slag Superfund Site  
Old Bridge/ Sayreville, New Jersey

USACE Contract No. W912DQ-08-D-0018  
Task Order No. 018

November 2010

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*Final Test Excavation Data Summary Report*

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## Acronyms

ABS	absolute difference values
APP	Accident Prevention Plan
ATSDR	Agency for Toxic Substances and Disease Registry
bgs	below the ground surface
CDM	CDM Federal Programs Corporation
CLP	Contract Laboratory Program
CN	cyanide
CRQL	contract required quantitation limit
DQI	data quality indicator
EDD	electronic data deliverable
EPA	Environmental Protection Agency
ERT	Emergency Response Team
FCR	field change request
GC/MS	gas chromatograph/mass spectrometer
GPS	Global Positioning System
Hg	mercury
ICP	inductively coupled plasma
J	estimated
LCS	laboratory control sample
MDL	method detection limit
mg/kg	milligram per kilogram
mg/m <sup>3</sup>	milligram per meter cubed
MS/MSD	matrix spike/matrix spike duplicate
ng/ml	nanogram per milliliter
NJDEP	New Jersey Department of Environmental Protection
NJRDCSRS	New Jersey Residential Direct Contract Health Based Criteria and Soil Remediation Standards
PAL	project action limit
PCB	polychlorinated biphenyl
PID	photo-ionization detector
PPE	personal protective equipment
PQL	project quantitation limit
QAPP	quality assurance project plan
QA/QC	quality assurance/quality control
RI/FS	remedial investigation/feasibility study
RPD	relative percent difference
SOP	standard operating procedure
SVOC	semi-volatile organic compound
TAL	Target Analyte List
TAT	turnaround time
TCL	Target Compound List
TOC	total organic carbon
The site	Raritan Bay Slag Superfund Site
USACE	United States Army Corps of Engineers
VOC	volatile organic compound
µg/kg	microgram per kilogram



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µg/L            microgram per liter

# Section 1

## Introduction

Under the United States Army Corps of Engineers (USACE), Kansas City District, Contract No. W912DQ-08-D-0018, Task Order No. 018, CDM Federal Programs Corporation (CDM) was tasked to provide technical services to complete a Remedial Investigation/Feasibility Study (RI/FS) for the Raritan Bay Slag Superfund Site (the site) located in Old Bridge and Sayreville, Middlesex County, New Jersey (Figure 1). This Test Excavation Data Summary Report details the results of the test excavation activities conducted in April and May 2010 in the vicinity of the seawall (Site Areas 1, 2, and 4) as part of the initial field activities of the RI/FS. The field investigation was conducted in accordance with USACE regulations, guidance, and standards, as well as the site-specific April 2010 Final Quality Assurance Project Plan (QAPP) (CDM 2010a), the April 2010 Final Accident Prevention Plan (APP) (CDM 2010b), and the April 19, 2010 Amendment 1 to the APP (CDM 2010c).

### 1.1 Purpose and Objectives

Previous geophysical investigations conducted by the Environmental Protection Agency (EPA) Emergency Response Team (ERT) indicated the potential for buried slag from a secondary lead smelter in areas along the seawall (Areas 1 and 4) and the beach (Area 2) at the site. The Site Areas are shown on Figure 2. ERT recommended that an additional investigation be performed to determine if buried slag is present in these areas. The purpose of the test excavation activities was to determine the nature and extent of slag in Areas 1, 2, and 4 by visual observation and targeted subsurface soil sampling.

The objectives of the test excavation activities were to:

- Provide information about the distribution of slag in the vicinity of the seawall and beach to facilitate potential early actions at the site
- Gather data to support subsequent RI/FS activities

In addition to test excavation activities, surface soil sampling was conducted in Areas 1 and 4 to gather additional data to supplement the existing surface soil sample dataset.

### 1.2 Contents

This Final Data Summary Report includes the sections described below.

- **Section 1 Introduction** – Presents the current understanding of the location and history of the site.
- **Section 2 Field Investigation** – Discusses the test excavation investigation and sampling activities conducted in Areas 1, 2, and 4 as part of the RI/FS initial field activities.

- **Section 3 Summary of Test Excavation Data** – Provides the information gathered during test excavation activities and the results of the laboratory analyses performed on samples collected from the test excavations.
- **Section 4 Summary** – Summarizes information gathered during the test excavation activities.
- **Section 5 References** – Lists documents used to perform the investigation.

### 1.3 Site Background

The site is located in Old Bridge and Sayreville, New Jersey, as shown in Figure 1. The site encompasses wetlands, shoreline and beaches, upland areas adjacent to the shore, and sediments in the near-shore side of Raritan Bay.

The park waterfront is protected by a seawall that was constructed approximately 40 years ago. Materials used to construct the seawall included slag from a secondary lead smelter. The western jetty at the Cheesequake Creek Inlet and the adjoining waterfront area west of the jetty are located in Sayreville. These areas also contain slag. The seawall, jetties, beach area east of the Cheesequake Creek Inlet, and the western jetty at the Cheesequake Creek Inlet are popular fishing areas. The beaches east of the Cheesequake Creek Inlet and west of the seawall appear to be the most popular for swimming.

#### 1.3.1 Site Location

The site is located on the shore of Raritan Bay in the eastern part of Old Bridge Township in the Laurence Harbor section of Middlesex County, New Jersey. A small portion of the north end of the site, the western jetty at the Cheesequake Creek Inlet, is located in the Borough of Sayreville. The site is bordered to the north by Raritan Bay and to the east, west, and south by residential properties. State Highway 35 is located to the south beyond the residential properties.

The site is approximately 1.3 miles in length and consists of the waterfront area between Margaret's Creek and the area just beyond the western jetty at the Cheesequake Creek Inlet. The portion of the site in Laurence Harbor is part of what is now called the Old Bridge Waterfront Park. The park has walking paths, a playground area, several public beaches, and three jetties (in addition to the two at the Cheesequake Creek Inlet).

#### 1.3.2 Site History

Approximately 40 years ago, slag from a secondary lead smelter was used at the site to construct the seawall along Raritan Bay and to augment an existing jetty on the western side of the Cheesequake Creek Inlet. In the secondary lead smelting process, lead-acid batteries and other lead-containing materials were melted in a smelter kettle. The valuable metals were skimmed from the top of the kettle, and the residue on the bottom cooled and hardened into slag. The dense rock-like properties of the slag made it attractive for use in the seawall and jetty construction.

The placement of the slag at the site has resulted in the leaching of heavy metals, including lead, arsenic, antimony, copper, and chromium into the surrounding Raritan Bay surface water, sediments, and near-shore soils. Additionally, as the saltwater weathers the slag, particles from the slag erode and mix into the sediments and soils at the site.

In 2007, elevated levels of lead, antimony, arsenic, and copper were identified by the New Jersey Department of Environmental Protection (NJDEP) in the soil along the seawall and at the edge of the beach near the western end of the seawall. In response, Old Bridge Township placed a temporary "snow" fence in this area, posted "Keep-off" signs in the park along the split rail fence that borders the edge of the seawall, and notified the residents of Laurence Harbor.

EPA collected samples at the site in September 2008 as part of an Integrated Assessment. The sampling included the collection of soil, sediment, water, biological, and waste samples from along the seawall in Laurence Harbor, the western jetty at the Cheesequake Creek Inlet, the beaches near these two locations, and the developed portion of the park. Analytical results generated by both EPA and NJDEP indicate that levels of lead and other heavy metals are present at concentrations exceeding applicable standards in the soils, sediment, and surface water in and around both the seawall in Laurence Harbor and the western jetty at the Cheesequake Creek Inlet.

At EPA's request, the New Jersey Department of Health and Senior Services, in cooperation with the Agency for Toxic Substances and Disease Registry (ATSDR), evaluated the analytical data from the samples collected at the site. Their findings concluded that, due to the elevated lead levels, a Public Health Hazard exists at the seawall in Laurence Harbor, the beach between the western end of the seawall and the first jetty, and the western jetty at the Cheesequake Creek Inlet, including the waterfront area immediately west of the inlet. As a result of this determination, EPA restricted access to these areas (by installing fences and posting signs) and provided public outreach to inform residents and those using these areas of the health hazard that exists.

The site is divided into 11 Site Areas based on areas identified in historical investigations and reports, site physical characteristics, and the locations of known or potential sources. Figure 2 shows the Site Areas. The test excavation efforts conducted during the field activities focused on Areas 1, 2, and 4. Area 1 is the Laurence Harbor Seawall along Old Bridge Waterfront Park. The seawall starts to the west of Margaret's Creek and extends west to the beach area at the foot of Laurence Parkway. Area 2 is the Laurence Harbor Beach area at the foot of Laurence Parkway between the western end of the seawall and the first jetty. Area 4 is the Old Bridge Waterfront Park area along the seawall (not including the playground) from the fence to the roadway.

## Section 2

### Field Investigation

The slag distribution study was conducted along the seawall (Areas 1 and 4) and the beach area adjacent to the seawall (Area 2) in April and May, 2010. This component of the RI/FS activities consisted of the following tasks:

- Mobilization
- Test excavations along transects advanced perpendicular to the seawall
- Collection and analysis of surface and subsurface soil samples at test excavations along each transect
- Site restoration and demobilization

The test excavation field investigation activities were conducted in accordance with the planning documents listed in Section 1. Deviations from the Final QAPP during the field investigation were limited to changes in the type and number of samples collected and the addition or deletion of transect and/or test excavation locations, as well as changes to the particulate monitoring action level to reflect the APP Amendment 1. The deviations are detailed on the Field Change Request (FCR) forms presented in Attachment 1. The FCR forms describe the deviations from the Final QAPP, the reason for the deviations, and the recommended modifications. The deviations were discussed with the client and project team prior to implementation.

#### 2.1 Mobilization

Site reconnaissance activities were performed to support mobilization, set up safety perimeters around the field activities, and to prepare for test excavation and sampling activities. Prior to beginning the field program, representatives from EPA, USACE, CDM, and the Township of Old Bridge assessed potential logistical issues and physical access constraints prior to marking the proposed transect locations. During the April 7, 2010 site visit, the test excavation locations were field verified and staked out, and the field support areas were selected. Subsequently, CDM marked out transects along which the test excavations were to be advanced. Prior to the commencement of field activities, the fence line was mapped with a hand-held Global Positioning System (GPS).

All rental equipment and field supplies were mobilized to the site prior to the start of field activities. Upon receipt, the field equipment was inspected for acceptability, and instruments were calibrated and checked to ensure they worked properly.

On April 22, 2010, the Old Bridge Municipal Utilities Authority completed a geophysical mark-out at the site to clearly identify the subsurface forced main sewer line that traverses Areas 1 and 2. In addition, as-built drawings showing the locations of subsurface electrical lines associated with park lighting and other site features were obtained from the Old Bridge Municipal Utilities Authority. The drawings were used to adjust test excavation locations to avoid any potential contact with subsurface utilities.

## 2.2 Test Excavations

Test excavation activities were conducted between April 21 and May 5, 2010. Twenty-six test excavations were advanced with an excavator operated by CEMCO, a subcontractor to CDM. Test excavations were advanced along 12 transects oriented approximately perpendicular to the shoreline and seawall. The test excavation length and width varied from location to location. Excavations were extended to the water table or to a depth of 10 feet below the ground surface (bgs), whichever was encountered first. The locations of transects and test excavations are depicted in Figure 3. Key features of transects and test excavations are summarized in Table 1.

Soil and slag were characterized by visual observation and recorded in test excavation logs by the on-site geologist. Test excavation logs are provided in Attachment 2. Details about material encountered in the excavations are provided in Table 1.

During excavation, a photo-ionization detector (PID) was used to screen the filled bucket and the excavation opening immediately after each fresh cut was made in the ground. Continuous, real-time air monitoring for particulates was conducted during intrusive activities in accordance with the Air Monitoring Plan detailed in the APP (CDM 2010b) and the APP Amendment 1 (CDM 2010c).

Excavated soil was stockpiled on plastic sheeting adjacent to each test excavation. Upon completion of each excavation, the soils were returned to their original location in the test excavation in two-foot lifts and tamped. The excavator bucket was cleaned with a steam cleaner prior to the start and completion of test excavation activities and between individual test excavations. Wash water from the bucket cleaning process was returned to the test excavations.

## 2.3 Soil Sampling

Forty-five soil samples and 6 field duplicate samples were collected during test excavation activities (total of 51 soil samples). Sample locations are shown on Figure 4. A sample summary is provided in Table 2. The samples are organized in the table numerically by transect. Table 2 includes information regarding the Site Areas from which the samples were collected. Sampling was conducted in accordance with the procedures outlined in the QAPP (CDM 2010a). Disposable aluminum foil trays were used to homogenize the soil samples. Pre-cleaned, individually wrapped, plastic scoops were used to collect soil samples.

Twenty of the 51 samples were surface soil samples (17 surface soil samples and 3 duplicates), with at least 1 surface soil sample from each of the 12 test excavation transects. Surface soil sample locations were selected across Areas 1 and 4 to provide equal sample coverage for both of these areas, as existing data from these two areas were limited. A total of 7 surface samples and 2 duplicates were collected from Area 1, and 8 surface samples and 1 field duplicate were collected from Area 4. Two surface soil samples were collected in Area 2. Prior to collection of the surface samples, the excavator removed soil from the beginning of each test excavation to a depth of two feet. The surface soil samples were collected from the sidewall of the excavation from the ground surface to a depth of two feet bgs.

The remaining 31 samples were collected from subsurface soils (28 subsurface soil samples and 3 duplicates). All subsurface soil samples were collected above the groundwater table. In general, subsurface soil samples were biased to the interval just below suspected slag or where other fill materials were encountered. Fill material was differentiated from beach materials by visually observing changes in soil characteristics or by the obvious presence of fill materials (e.g., brick, concrete, wood). Where neither slag nor fill materials were encountered in a test excavation, a representative soil sample was collected at the approximate midpoint of the excavation from the interval just above the water table. Sample rationale, depths, and the nature of the material sampled are detailed in Table 2 and on the test excavation logs in Attachment 2.

Sample collection, packaging, and shipping were conducted in strict accordance with the procedures outlined in Worksheet #26 of the QAPP (CDM 2010a). Sample custody was conducted in strict accordance with the procedures outlined in Worksheet #27 of the QAPP (CDM 2010a). All soil samples were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), Target Analyte List (TAL) metals (including cyanide and mercury), percent moisture, and hexavalent chromium. In addition, 20 percent of the soil samples collected (frequency of 1 in 5 samples) were analyzed for pH, total organic carbon (TOC), and grain size. Analytical and preparation methods, sample volumes, sample container and preservation, and sample holding time requirements are provided in Worksheet #19 of the QAPP (CDM 2010a).

Test excavation soil samples were analyzed using EPA's Contract Laboratory Program (CLP). TOC, hexavalent chromium, percent moisture, and grain size were analyzed by CDM's subcontract laboratory, Shealy Environmental Services. Sample results were requested on a 14-day turnaround time (TAT).

### 2.3.1 Quality Assurance/Quality Control Samples

Quality assurance/quality control (QA/QC) samples were collected during soil sampling. Six field duplicate soil samples were collected and are identified on Table 2. One field blank was collected at the commencement of test excavation activities by pouring demonstrated analyte-free water over a clean, disposable scoop into a new aluminum foil pan and then pouring the water from the pan into the sample collection bottles. The field blank was analyzed for TCL VOCs, SVOCs, pesticides, PCBs, TAL metals, and hexavalent chromium. Field blanks were not collected after decontamination took place because all of the equipment was disposable. As a result, there were no decontamination events for sampling equipment. The equipment field blank was collected as a QC check on the disposable equipment. Five matrix-spike/matrix-spike duplicate (MS/MSD) samples were collected, as indicated in Table 2. QA/QC samples were collected in accordance with the procedures outlined in Worksheet #28 of the QAPP (CDM 2010a).

## **2.4 Demobilization**

Site restoration activities included compacting, leveling, and seeding (where needed) to restore the excavation areas to pre-investigation conditions and remedy any other impacts associated with the operation of heavy equipment. Backfilling, tamping with the excavator bucket, and leveling of the test excavations occurred in two-foot lifts immediately after completion of each test excavation, before proceeding to the next test excavation. Where needed, topsoil and sod were replaced, and/or seeding occurred at the completion of test excavation activities.

## **2.5 Investigation-Derived Waste Disposal**

Steam-cleaning of the heavy equipment was performed and rinse water was returned directly to each respective test excavation before mobilization to the next location and before demobilization from the site. Excavated soil was stockpiled on plastic sheeting adjacent to each test excavation. The stockpiled soils were returned to their original location in the test excavation in two-foot lifts and tamped. Personal protective equipment (PPE) (e.g., gloves, splash suits, and disposable boots) and other items such as plastics and paper towels were placed in a roll-off and disposed of at the Middlesex County Landfill (Facility I.D. No. 1204A) as non-hazardous municipal waste. The non-hazardous waste bill of lading is provided in Attachment 3.

## Section 3

### Summary of Test Excavation Data

This section provides a summary of the results of the test excavation field activities including analytical data from the soil sampling. Discussion of the validated analytical results from the soil investigation focuses on contaminant concentrations that exceed the screening criteria as well as the primary contaminants at the site: lead, arsenic, antimony, chromium, and copper.

#### 3.1 Field Observations

Field screening of the site soils included visual and/or olfactory observations. Results of the field observations are presented on the test excavation logs included in Attachment 2.

Slag was visually observed in 7 of the 26 test excavations along Transects 8, 9, 10, and 11. These transects correspond to the eastern end of the seawall in Areas 1 and 4. Specifically, slag was identified in Area 1 at all test excavations along Transects 9 and 10. In Area 4, slag was identified in test excavation 3 along Transect 8, test excavation 2 along Transect 9, and test excavations 1 through 3 along Transect 11. The extent of the slag is provided in Table 1 and in the test excavation logs (Attachment 2).

#### 3.2 Analytical Sample Results

The analytical results from the test excavation field activities were uploaded into an EQUIS database for evaluation purposes. The values used to determine project quantitation limits (PQLs) in the QAPP included NJDEP standards and criteria, human health screening values, and ecological screening values. For the test excavation report, the results of the soil sample analyses, with the exception of hexavalent and total chromium, were screened against the New Jersey Residential Direct Contact Soil Remediation Standards (NJRDCSRS) (NJDEP 2009). This is consistent with the screening criteria used in the Beach Sampling Report. The screening criteria are listed in Table 3.

The NJRDCSRS does not include standards for hexavalent chromium, total chromium, or individual PCB Aroclors. CDM used the NJDEP "Soil Cleanup Criteria" of 240 milligrams per kilogram (mg/kg) for hexavalent chromium as the screening criteria for hexavalent chromium (NJDEP 1999). CDM used the NJDEP "Soil Cleanup Criteria" of 120,000 mg/kg for trivalent chromium as the screening criteria for total chromium (NJDEP 1999). The NJRDCSRS includes a standard of 0.2 mg/kg for PCBs but does not list standards for individual Aroclors so this value, 0.2 mg/kg, was applied to the individual Aroclors. During the Remedial Investigation, soil and sediment samples may be screened against other applicable and appropriate criteria as detailed in the site-specific QAPP.

Grain size distribution curves are provided in Attachment 4. The dominant grain size across the site is sand, with the sand fraction constituting generally over 70% of the sample distribution.

### 3.2.1 Data Quality

The data presented in this report have been evaluated in a Data Usability Summary. Validation of the data was performed by EPA, with the exception of TOC data, which were validated by CDM. The Data Usability Summary and data validation reports are provided in Attachment 5.

As discussed in the data quality assessment provided in Attachment 5, CDM identified an error in the EPA validation reports regarding field duplicate comparisons. This error resulted in the rejection of 20 metal analytes for samples MB7Q68 (T9TP2-SS2) and MB7PT0 (T25P9-SS3). The validation reports, Form Is, and electronic data deliverables (EDDs) have been corrected by EPA, and the correct data are reflected in this report.

### 3.2.2 Comparison of Analytical Results to Screening Criteria

The analytical results of the test excavations are presented on Tables 4 through 8. Surface soil sample results that exceed the NJRDCSRS are presented on Figures 5 and 6. Subsurface soil sample results that exceed the NJRDCSRS are presented on Figures 7 and 8. For the purposes of this summary, only data that were not rejected (flagged with an "R" laboratory qualifier) are discussed. Estimated results are qualified with a "J".

#### Volatil Organic Compounds

VOCs were not detected at concentrations exceeding the NJRDCSRS. VOC results are presented in Table 4.

#### Semi-volatile Organic Compounds

SVOC results are presented in Table 5. Dibenzo(a,h)anthracene was detected in the surface soil sample collected from test excavation 1 along Transect 5 at 360 J micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ), which exceeds the NJRDCSRS of 200  $\mu\text{g}/\text{kg}$ .

#### Pesticides and PCBs

Pesticide and PCB results are presented in Table 6. Pesticides were not detected at concentrations exceeding the NJRDCSRS.

Aroclor 1254 was detected in the field duplicate surface soil sample collected from test excavation 3 along Transect 11 at a concentration of 1,100  $\mu\text{g}/\text{kg}$ , which exceeds the NJRDCSRS of 200  $\mu\text{g}/\text{kg}$  for PCBs. Aroclor 1254 was detected in the environmental sample of this field duplicate at a concentration of 130  $\mu\text{g}/\text{kg}$ .

#### Metals

The primary contaminants were detected above the NJRDCSRS screening criteria in four surface and four subsurface soil samples (and two field duplicates). Copper was not detected in surface or subsurface soils at concentrations exceeding the NJRDCSRS. Nineteen chromium results were rejected during data validation; no remaining chromium results exceeded their respective screening criteria. Metals results are summarized in Table 7. Results of the pH and TOC analyses are also presented in

this table.

#### ***Surface Soil Results***

Lead - The following samples contained lead at concentrations exceeding the NJRDCSRS of 400 mg/kg for lead:

- T3TP1-SS1: Sample from test excavation 1 along Transect 3, lead was detected at 1,020 J mg/kg and 1,390 J mg/kg in its field duplicate (T25TP9-SS2).
- T4TP1-SS1: Sample from test excavation 1 along Transect 4, lead was detected at 1,380 J mg/kg.
- T9TP2-SS2: Sample collected from test excavation 2 along Transect 9, lead was detected at 5,080 J mg/kg.

Arsenic - The following samples contained arsenic at concentrations exceeding the NJRDCSRS of 19 mg/kg for arsenic:

- T3TP1-SS1: Sample from test excavation 1 along Transect 3, arsenic was detected at 25 J mg/kg and 21.4 J mg/kg in its field duplicate (T25TP9-SS2).
- T9TP2-SS2: Sample collected from test excavation 2 along Transect 9, arsenic was detected at 78 J mg/kg.
- T11TP3-SS1: Sample from test excavation 3 along Transect 11, arsenic was detected at 80.2 J mg/kg and 24.4 J mg/kg in its field duplicate (T25TP9-SS6).

Antimony - The following samples contained antimony at concentrations exceeding the NJRDCSRS of 31 mg/kg for antimony:

- T3TP1-SS1: Sample from test excavation 1 along Transect 3, antimony was detected at 35 J mg/kg and 53.3 J mg/kg in its field duplicate (T25TP9-SS2).
- T4TP1-SS1: Sample from test excavation 1 along Transect 4, antimony was detected at 80.5 J mg/kg.

No additional metals were detected at concentrations exceeding their respective NJRDCSRS screening criteria.

#### ***Subsurface Soil Results***

Lead - The following samples contained lead at concentrations exceeding the NJRDCSRS of 400 mg/kg for lead:

- T6TP1-SS2: Sample collected from 4 to 4.5 feet bgs from test excavation 1 along Transect 6, lead was detected at 614 J mg/kg.
- T8TP3-SS1: Sample collected from 2 to 2.5 feet bgs from test excavation 3 along Transect 8, lead was detected at 1,000 J mg/kg.
- T9TP2-SS1: Sample collected from 1 to 2 feet bgs from test excavation 2 along Transect 9, lead was detected at 1,650 J mg/kg.

Arsenic - The following samples contained arsenic at concentrations exceeding the NJRDCSRS of 19 mg/kg for arsenic:

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- T1TP2-SS2: Sample collected from 9.5 to 10 feet bgs from test excavation 2 along Transect 1, arsenic was detected at 67.4 J mg/kg.
- T9TP2-SS1: Sample collected from 1 to 2 feet bgs from test excavation 2 along Transect 9, arsenic was detected at 23.6 J mg/kg.

Antimony - The following sample contained antimony at a concentration exceeding the NJRDCSRS of 31 mg/kg for antimony:

- T8TP3-SS1: Sample collected from 2 to 2.5 feet bgs from test excavation 3 along Transect 8, antimony was detected at a concentration of 36.5 mg/kg.

No additional metals were detected at concentrations exceeding their respective NJRDCSRS screening criteria.

## Section 4

### Summary

Metals identified at concentrations exceeding the NJRDCSRS included lead, arsenic, and antimony. Two other compounds were detected sporadically at concentrations exceeding their respective NJRDCSRS criteria: PCBs and dibenzo(a,h)anthracene.

#### *Surface Soil*

Inorganic contaminant concentrations exceeded screening criteria in surface soils along Transects 3, 4, 9, and 11 (Areas 1 and 4). The highest concentration of lead occurred at test excavation 2 along Transect 9 (5,080 J mg/kg). The highest concentration of arsenic occurred at test excavation 3 along Transect 11 (80.2 J mg/kg). The highest concentration of antimony was detected at test excavation 1 along Transect 4 (80.5 J mg/kg).

Aroclor 1254 was detected at a concentration of 1,100 µg/kg at test excavation 3 along Transect 11. Dibenzo(a,h)anthracene (360 J µg/kg) was detected at test excavation 1 along Transect 5. Both detections exceed the NJRDCSRS.

#### *Subsurface Soil*

The occurrence of slag in subsurface materials was sporadic and was visually observed in 7 of the 26 test excavations located along the eastern end of the seawall in Areas 1 and 4:

- Transect 8, Test Excavation 3 in Area 4
- Transect 9, Test Excavations 1 and 2 in Areas 1 and 4
- Transect 10, Test Excavation 1 in Area 1
- Transect 11, Test Excavations 1, 2, and 3 in Area 4

The locations and depths of the slag encountered during test excavation activities are depicted on Figure 9.

Subsurface soil sampling confirmed that concentrations of site-related contaminants were below the screening criteria at these locations, with the exception of test excavation 3 along Transect 8 and test excavation 2 along Transect 9.

While the subsurface sample from test excavation 3 along Transect 8 exceeded the NJRDCSRS for lead (1,000 J mg/kg) and antimony (36.5 mg/kg), the sample was collected where slag was observed, only four feet from the starting point of the test excavation. This test excavation was ultimately extended 33 feet from its starting point, and slag was not observed beyond 19 feet from the starting point.

Likewise, the subsurface sample from test excavation 2 along Transect 9 that exceeded the NJRDCSRS for lead (1,650 J mg/kg) and arsenic (23.6 J mg/kg) was collected immediately below slag material. The test excavation was extended an additional 4 feet to the south of the sampling point. Slag was not visually observed at the excavation terminus.

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In addition, inorganic compounds exceeded the NJRDCSRS in two subsurface soil samples collected along Transects 1 and 6. Slag was not identified along either transect during test excavation activities. The sample from Transect 1 was collected south of observed fill materials in test excavation 2. The sample collected from Transect 6 was a bottom sample from test excavation 1; no fill material was observed at this location. Lead was detected at its highest concentration at test excavation 1 along Transect 6 (614 J mg/kg). Arsenic was detected at test excavation 2 along Transect 1 at a concentration of 67.4 J mg/kg.

In general, visual confirmation of the absence of slag materials was accomplished in subsurface soils along the seawall (Areas 1 and 4). Additionally, no slag was identified in test excavations advanced in Area 2.

## Section 5

### References

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New Jersey Department of Environmental Protection. 1999. Soil Cleanup Criteria (mg/kg), <http://www.nj.gov/dep/srp/guidance/scc/>. Revised 12 May 1999. Last accessed June 25, 2010.

\_\_\_\_\_. 2009. NJDEP Residential Direct Contact Health Based Criteria and Soil Remediation Standards. Revised November 4, 2009.  
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## TABLES

**TABLE 1**  
**Test Excavation Data Summary**  
**Test Excavation Summary**  
**Raritan Bay Slag Superfund Site**  
**Old Bridge and Sayreville, NJ**

Test Excavation	Area	Excavation Length (ft)	Excavation Width (ft)	Excavation Depth (ft)	Date Completed	Materials Observed
<b>Transect 1</b>						
1	Area 2	25	2	10	4/22/2010	reworked native materials*
2	Area 2	27	2	10	4/22/2010	reworked native materials
3	Area 2	30	2	9	4/22/2010	Fill materials: large concrete pieces 4 ft south of starting location at 4 ft bgs, 10 ft south of starting point at 8 ft bgs
<b>Transect 2</b>						
1	Area 2	20	2	5	4/21/2010	Fill materials 0 to 2.5 ft bgs
2	Area 2	35.5	2	9.3	4/21/2010	Fill materials: brick/rock from 0 to 2 ft bgs, wood (piling) at 2.5 ft bgs. NOTE: Excavation broken in half due to a large brick/rock area encountered along the transect.
<b>Transect 3</b>						
1	Area 1	36	2	9	4/26/2010	reworked native materials
<b>Transect 4</b>						
1	Area 1	30	2	10	4/26/2010	Fill materials: concrete/rebar 20 ft south of starting point at 5 ft bgs
2	Area 4	5	2	10	5/3/2010	reworked native materials
<b>Transect 5</b>						
1	Area 1	25	2	10	4/29/2010	reworked native materials
<b>Transect 6</b>						
1	Area 1	30	2	10	4/27/2010	reworked native materials
2	Area 4	20	2	10	5/3/2010	reworked native materials
<b>Transect 7</b>						
1	Area 1	20	2	10	4/28/2010	reworked native materials
<b>Transect 8</b>						
1	Area 1	22	2	8	4/27/2010	reworked native materials
2	Area 4	20	2	12	5/4/2010	reworked native materials
3	Area 4	21	2	7	5/4/2010	Slag: 13.5 to 19 ft east of starting point at 2 ft bgs

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Test Excavation	Area	Excavation Length (ft)	Excavation Width (ft)	Excavation Depth (ft)	Date Completed	Materials Observed
<b>Transect 9</b>						
1	Area 1	21.5	2	10	4/28/2010	Slag: 1 to 1.5 inch-diameter pieces 15 ft south of starting point at 4 ft bgs to terminus of test excavation (slag at terminus at 1 ft bgs was much smaller in diameter)
2	Areas 1 / 4	20	2	10	4/28/2010	Slag: 2-inch layer from fence to 2' south of fence
<b>Transect 10</b>						
1	Area 1	43	2	10	4/30/2010	Slag: 2-inch pieces of tightly compacted slag observed 2 ft to 34 ft south of starting point at 4 ft bgs
<b>Transect 11</b>						
1	Area 4	20	2	10	4/29/2010	Slag: compacted fragments/chunks observed 2 ft to 16 ft south of starting point at 4 ft bgs
2	Area 4	20	2	10	5/4/2010	Slag: 1-inch chips to 1-ft blocks toward northwest corner of excavation from 3 to 5 ft bgs
3	Area 4	28	2	4	5/5/2010	Slag: 2-3-inch diameter chunks 5 ft bgs, 4 to 18 ft west of starting point
4	Area 4	5	2	7	5/5/2010	reworked native materials
5	Area 4	5	2	7	5/5/2010	reworked native materials
<b>Transect 12</b>						
1	Area 4	12	2	10	4/23/2010	reworked native materials
2	Area 1	16	2	10	4/23/2010	reworked native materials
3	Area 4	29	2	10	4/23/2010	reworked native materials

**NOTES**

\* reworked native materials - fine gravelly coarse sand beach deposits mixed with slag and occasional pieces of fill or debris  
ft - feet  
bgs - below ground surface

**TABLE 2**  
**Test Excavation Data Summary**  
**Sample Summary**  
**Raritan Bay Slag Superfund Site**  
**Old Bridge and Sayreville, NJ**

Sample Name	Area	Test Excavation Number	Sample Depth (ft bgs)	Sample Matrix	Date	Time	Analysis	Notes
<b>QA/QC SAMPLES</b>								
FB-042110	n/a	n/a	n/a	Analyte-free water	4/21/2010	9:00	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium	Field Blank collected of analyte-free water
<b>SOIL SAMPLES</b>								
<b>Transect 1</b>								
T1TP1-SS1	Area 2	1	8.5-9	Soil - Subsurface	4/22/2010	8:45	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 27 ft south of starting point in excavation from excavation bottom just above water table. No visual observation of slag.
T1TP2-SS2	Area 2	2	9.5-10	Soil - Subsurface	4/22/2010	11:10	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 25 ft south of starting point from bottom of excavation just above water table. No visual observation of slag.
T1TP3-SS1	Area 2	3	0-2	Soil - Surface	4/22/2010	13:25	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 2 ft south of starting point adjacent to fill material.
T1TP3-SS2	Area 2	3	9.5-10	Soil - Subsurface	4/22/2010	14:15	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 5 ft south of starting point from bottom of excavation just above water table. No visual observation of slag.
T25TP9-SS1	Area 2	3	9.5-10	Soil - Subsurface	4/22/2010	14:15	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Duplicate of T1TP3-SS2.
<b>Transect 2</b>								
T2TP1-SS1	Area 2	1	4-4.5	Soil - Subsurface	4/21/2010	10:15	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 16.5 ft south of starting point from bottom of excavation just above water table. No visual observation of slag.
T2TP2-SS2	Area 2	2	7.5-8	Soil - Subsurface	4/21/2010	11:40	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 2 ft north of starting point from bottom of excavation just above water table. No visual observation of slag.
T2TP2-SS3	Area 2	2	6.5-7	Soil - Subsurface	4/21/2010	14:00	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 6 ft north of brick/rock area from bottom of excavation after its collapse.
T2TP2-SS4	Area 2	2	0-1	Soil - Surface	4/22/2010	15:00	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 5 ft south of the endpoint adjacent to fill material.
<b>Transect 3</b>								
T3TP1-SS1	Area 1	1	0-2	Soil - Surface	4/26/2010	8:20	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 3 ft south of starting point adjacent to fill material.
T25TP9-SS2	Area 1	1	0-2	Soil - Surface	4/26/2010	8:20	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Duplicate of T3TP1-SS1.

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**TABLE 2**  
**Test Excavation Data Summary**  
**Sample Summary**  
**Raritan Bay Slag Superfund Site**  
**Old Bridge and Sayreville, NJ**

Sample Name	Area	Test Excavation Number	Sample Depth (ft bgs)	Sample Matrix	Date	Time	Analysis	Notes
T3TP1-SS2	Area 1	1	4-4.5	Soil - Subsurface	4/26/2010	9:00	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture, TOC, pH, grain size	Collected 20 ft south of starting point just below observed fill-native material interface.
T3TP1-SS3	Area 1	1	7.5-8	Soil - Subsurface	4/26/2010	9:30	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 33 ft south of starting point from bottom of excavation just above water table. No visual observation of slag.
<b>Transect 4</b>								
T4TP1-SS1	Area 1	1	0-2	Soil - Surface	4/26/2010	11:30	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 21 ft south of starting point adjacent to fill material.
T4TP1-SS2	Area 1	1	8-8.5	Soil - Subsurface	4/26/2010	11:45	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 15 ft south of starting point from bottom of excavation just above water table. No visual observation of slag.
T4TP2-SS1	Area 4	2	0-2	Soil - Surface	5/3/2010	10:40	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 3 ft south of starting point - representative surface soil sample (no indication of fill/slag).
T4TP2-SS2	Area 4	2	5-6	Soil - Subsurface	5/3/2010	10:45	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture, TOC, pH, grain size	Collected 4 ft south of starting point from sidewall just above water table. No visual observation of slag. MS/MSD collected here.
<b>Transect 5</b>								
T5TP1-SS1	Area 1	1	0-2	Soil - Surface	4/29/2010	14:50	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 4 ft south of starting point - representative surface soil sample (no indication of fill/slag).
T5TP1-SS2	Area 1	1	6-7	Soil - Subsurface	4/29/2010	14:55	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 10 ft south of starting point from sidewall just above water table. No visual observation of slag.
<b>Transect 6</b>								
T6TP1-SS1	Area 1	1	0-2	Soil - Surface	4/27/2010	10:00	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 13.5 ft south of starting point adjacent to fill material.
T6TP1-SS2	Area 1	1	4-4.5	Soil - Subsurface	4/27/2010	10:05	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 13 ft south of starting point where transition from fill material to native soil was observed. MS/MSD collected here.
T6TP2-SS1	Area 4	2	1-2	Soil - Subsurface	5/3/2010	13:45	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 2 ft south of starting point - Representative surface soil sample (no indication of fill/slag).

**TABLE 2**  
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**Sample Summary**  
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Sample Name	Area	Test Excavation Number	Sample Depth (ft bgs)	Sample Matrix	Date	Time	Analysis	Notes
T25TP9-SS5	Area 4	2	1-2	Soil - Subsurface	5/3/2010	13:45	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Duplicate of T6TP2-SS1.
T6TP2-SS2	Area 4	2	4-5	Soil - Subsurface	5/3/2010	13:50	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 4 ft south of starting point. Bottom of excavation/water table at 10 ft bgs; due to excavation collapse the sample was collected from the slightly moist to very moist interval. No visual observation of slag.
<b>Transect 7</b>								
T7TP1-SS1	Area 1	1	0-2	Soil - Surface	4/28/2010	15:00	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 5 ft south of starting point adjacent to fill material.
T7TP1-SS2	Area 1	1	4-5	Soil - Subsurface	4/28/2010	15:15	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 10 ft south of starting point. Bottom of excavation/water table at 10 ft bgs; due to excavation collapse the sample was collected from the slightly moist to very moist interval. No visual observation of slag.
T25TP9-SS3	Area 1	1	4-5	Soil - Subsurface	4/28/2010	15:15	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Duplicate of T7TP1-SS2.
<b>Transect 8</b>								
T8TP1-SS1	Area 1	1	5-6	Soil - Subsurface	4/27/2010	14:45	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 20 ft south of starting point. Bottom of excavation/water table at 8 ft bgs; due to excavation collapse the sample was collected from the slightly moist to very moist interval on the sidewall. No visual observation of slag.
T8TP2-SS1	Area 4	2	0-2	Soil - Surface	5/4/2010	8:15	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected adjacent to fill material.
T8TP2-SS2	Area 4	2	7-9	Soil - Subsurface	5/4/2010	8:30	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Sample collected from north sidewall. No visual observation of slag.
T8TP3-SS1	Area 4	3	2-2.5	Soil - Subsurface	5/4/2010	11:00	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 4 ft east of starting point adjacent to SLAG material.
T8TP3-SS2	Area 4	3	4-4.5	Soil - Subsurface	5/4/2010	11:15	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 1 ft south of starting point below SLAG material.

**TABLE 2**  
**Test Excavation Data Summary**  
**Sample Summary**  
**Raritan Bay Slag Superfund Site**  
**Old Bridge and Sayreville, NJ**

Sample Name	Area	Test Excavation Number	Sample Depth (ft bgs)	Sample Matrix	Date	Time	Analysis	Notes
<b>Transect 9</b>								
T9TP1-SS1	Area 1	1	5-5.5	Soil - Subsurface	4/28/2010	10:00	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 21.5 ft south of starting point from interval immediately below SLAG material.
T9TP2-SS1	Area 4	2	1-2	Soil - Subsurface	4/28/2010	11:45	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture, TOC, pH, grain size	Collected 16 ft south of starting point from interval immediately below SLAG material.
T9TP2-SS2	Area 1	2	0.5 to 1.25	Soil - Surface	4/28/2010	12:00	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 1 ft south of starting point - representative surface soil sample (no indication of fill/slag).
<b>Transect 10</b>								
T10TP1-SS1	Area 1	1	0-2	Soil - Surface	4/30/2010	9:00	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 21.5 ft south of starting point - representative surface soil sample (no indication of fill/slag).
T10TP1-SS2	Area 1	1	4-5	Soil - Subsurface	4/30/2010	9:30	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 34 ft south of starting point from interval immediately below SLAG material.
T25TP9-SS4	Area 1	1	0-2	Soil - Surface	4/30/2010	9:00	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Duplicate of T10TP1-SS1.
<b>Transect 11</b>								
T11TP1-SS1	Area 4	1	0-2	Soil - Surface	4/29/2010	10:00	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 2 ft south of starting point - representative surface soil sample (no indication of fill/slag).
T11TP1-SS2	Area 4	1	5.5-6	Soil - Subsurface	4/29/2010	10:15	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture, TOC, pH, grain size	Collected 17 ft south of starting point from interval immediately below SLAG material.
T11TP2-SS1	Area 4	2	0-2	Soil - Surface	5/4/2010	14:50	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 2 ft south of starting point; representative surface soil sample (no indication of fill/slag).
T11TP2-SS2	Area 4	2	5-6	Soil - Subsurface	5/4/2010	15:15	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 4 ft south of starting point along north wall below SLAG material. MS/MSD collected here.
T11TP3-SS1	Area 4	3	0-2.5	Soil - Surface	5/5/2010	9:00	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 4 ft west of starting point - representative surface soil sample (no indication of slag).
T25TP9-SS6	Area 4	3	0-2.5	Soil - Surface	5/5/2010	9:00	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Duplicate of T11TP3-SS1.

**TABLE 2**  
**Test Excavation Data Summary**  
**Sample Summary**  
**Raritan Bay Slag Superfund Site**  
**Old Bridge and Sayreville, NJ**

Sample Name	Area	Test Excavation Number	Sample Depth (ft bgs)	Sample Matrix	Date	Time	Analysis	Notes
T11TP3-SS2	Area 4	3	5.5-6	Soil - Subsurface	5/5/2010	9:10	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 9 ft west of starting point from interval immediately below SLAG material at bottom of excavation.
T11TP4-SS1	Area 4	4	0-2	Soil - Surface	5/5/2010	11:20	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture, TOC, pH, grain size	Collected 2 ft west of starting point - representative surface soil sample (no indication of fill/slag). MS/MSD collected here.
T11TP5-SS2	Area 4	5	7-7.5	Soil - Subsurface	5/5/2010	13:10	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 4 ft south of starting point from bottom of excavation. No visual observation of slag.
<b>Transect 12</b>								
T12TP1-SS1	Area 4	1	0-2	Soil - Surface	4/23/2010	9:00	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 3 ft west of starting point adjacent to fill material.
T12TP1-SS2	Area 4	1	9.5-10	Soil - Subsurface	4/23/2010	9:30	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture, TOC, pH, grain size	Collected 5 ft west of starting point from bottom of excavation just above water table. No visual observation of slag.
T12TP2-SS1	Area 1	2	6.5-7	Soil - Subsurface	4/23/2010	10:15	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture, TOC, pH, grain size	Collected 4 ft south of starting point adjacent to where fill (concrete chunk) was identified (Note that Transect 12 was the attempt to identify the sea wall).
T12TP3-SS1	Area 4	3	6-6.5	Soil - Subsurface	4/23/2010	13:40	VOCs, TAL Metals, SVOCs, Pesticides, PCBs, Hexavalent Chromium, Moisture	Collected 21 ft north of starting point from sidewall (post-collapse of excavation). No visual observation of slag. MS/MSD collected here.

**NOTES**

QA/QC - quality assurance/quality control  
n/a - not applicable  
ft - feet  
bgs - below ground surface  
VOCs - volatile organic compounds  
SVOCs - semivolatile organic compounds  
TAL - Target Analyte List  
PCBs - polychlorinated biphenyls  
TOC - total organic carbon  
MS/MSD - matrix spike/matrix spike duplicate

**TABLE 3**  
**Test Excavation Data Summary**  
**Soil Screening Criteria**  
**Raritan Bay Slag Superfund Site**  
**Old Bridge and Sayreville, NJ**

CAS Number	Chemical Name	NJDEP Residential Direct Contact Soil Remediation Standard (NJRDCSRs) <sup>1</sup>	Soil and Sediment Screening Criteria
<b>Inorganic Analytes (mg/kg)</b>			
7429-90-5	Aluminum	78,000	78,000
7440-36-0	Antimony	31	31
7440-38-2	Arsenic	19 a	19
7440-39-3	Barium	16,000	16,000
7440-41-7	Beryllium	16	16
7440-43-9	Cadmium	78	78
7440-70-2	Calcium	NL	NL
7440-47-3	Chromium	120,000 b, 2	120,000
18540-29-9	Chromium (hexavalent)	240 c, 2	240
7440-48-4	Cobalt	1,600 a	1,600
7440-50-8	Copper	3,100	3,100
57-12-5	Cyanide	1,600	1,600
7439-89-6	Iron	NL	NL
7439-92-1	Lead	400	400
7439-95-4	Magnesium	NL	NL
7439-96-5	Manganese	11,000	11,000
7439-97-6	Mercury	23	23
7440-02-0	Nickel	1,600	1,600
7440-09-7	Potassium	NL	NL
7782-49-2	Selenium	390	390
7440-22-4	Silver	390	390
7440-23-5	Sodium	NL	NL
7440-28-0	Thallium	5	5
7440-62-2	Vanadium	78	78
7440-66-6	Zinc	23,000	23,000
<b>Volatile Organic Compounds (µg/kg)</b>			
71-55-6	1,1,1-Trichloroethane	290,000	290,000
79-34-5	1,1,2,2-Tetrachloroethane	1,000	1,000
79-00-5	1,1,2-Trichloroethane	2,000	2,000
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	NL	NL
75-34-3	1,1-Dichloroethane	8,000	8,000
75-35-4	1,1-Dichloroethene	11,000	11,000
87-61-6	1,2,3-Trichlorobenzene	NL	NL
120-82-1	1,2,4-Trichlorobenzene	73,000	73,000
96-12-8	1,2-Dibromo-3-chloropropane	80	80
106-93-4	1,2-Dibromoethane	8	8
95-50-1	1,2-Dichlorobenzene	5,300,000	5,300,000
107-06-2	1,2-Dichloroethane	900	900
78-87-5	1,2-Dichloropropane	2,000	2,000
541-73-1	1,3-Dichlorobenzene	5,300,000	5,300,000

**TABLE 3**  
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**Soil Screening Criteria**  
**Raritan Bay Slag Superfund Site**  
**Old Bridge and Sayreville, NJ**

CAS Number	Chemical Name	NJDEP Residential Direct Contact Soil Remediation Standard (NJRDSCRS) <sup>1</sup>	Soil and Sediment Screening Criteria
106-46-7	1,4-Dichlorobenzene	5,000	5,000
78-93-3	2-Butanone	3,100,000	3,100,000
591-78-6	2-Hexanone	NL	NL
108-10-1	4-Methyl-2-pentanone	NL	NL
67-64-1	Acetone	70,000,000	70,000,000
71-43-2	Benzene	2,000	2,000
74-97-5	Bromochloromethane	NL	NL
75-27-4	Bromodichloromethane	1,000	1,000
75-25-2	Bromoform	81,000	81,000
74-83-9	Bromomethane	25,000	25,000
75-15-0	Carbon Disulfide	7,800,000	7,800,000
56-23-5	Carbon Tetrachloride	600	600
123-91-1	1-4 Dioxane	NL	NL
108-90-7	Chlorobenzene	510,000	510,000
75-00-3	Chloroethane	220,000	220,000
67-66-3	Chloroform	600	600
74-87-3	Chloromethane	4,000	4,000
156-59-2	cis-1,2-Dichloroethene	230,000	230,000
10061-01-5	cis-1,3-Dichloropropene	NL	NL
110-82-7	Cyclohexane	NL	NL
124-48-1	Dibromochloromethane	3,000	3,000
75-71-8	Dichlorodifluoromethane	490,000	490,000
100-41-4	Ethylbenzene	7,800,000	7,800,000
98-82-8	Isopropylbenzene	NL	NL
79-20-9	Methyl Acetate	78,000,000	78,000,000
1634-04-4	Methyl Tert-Butyl Ether	110,000	110,000
108-87-2	Methylcyclohexane	NL	NL
75-09-2	Methylene Chloride	34,000	34,000
100-42-5	Styrene	90,000	90,000
127-18-4	Tetrachloroethene	2,000	2,000
108-88-3	Toluene	6,300,000	6,300,000
156-60-5	trans-1,2-Dichloroethene	300,000	300,000
10061-02-6	trans-1,3-Dichloropropene	NL	NL
79-01-6	Trichloroethene	7,000	7,000
75-69-4	Trichlorofluoromethane	23,000,000	23,000,000
75-01-4	Vinyl Chloride	700	700
1330-20-7	Xylenes (Total)	12,000,000 d	12,000,000
<b>Semi-Volatile Organic Compounds (µg/kg)</b>			
92-52-4	1,1'-Biphenyl	3,100,000	3,100,000
95-94-3	1,2,4,5-Tetrachlorobenzene	NL	NL
108-60-1	2,2'-oxybis(1-Chloropropane)	23,000	23,000

**TABLE 3**  
**Test Excavation Data Summary**  
**Soil Screening Criteria**  
**Raritan Bay Slag Superfund Site**  
**Old Bridge and Sayreville, NJ**

CAS Number	Chemical Name	NJDEP Residential Direct Contact Soil Remediation Standard (NJRDCSRS) <sup>1</sup>	Soil and Sediment Screening Criteria
95-95-4	2,4,5-Trichlorophenol	6,100,000	6,100,000
88-06-2	2,4,6-Trichlorophenol	19,000	19,000
120-83-2	2,4-Dichlorophenol	180,000	180,000
105-67-9	2,4-Dimethylphenol	1,200,000	1,200,000
51-28-5	2,4-Dinitrophenol	120,000	120,000
121-14-2	2,4-Dinitrotoluene	700	700
606-20-2	2,6-Dinitrotoluene	700	700
91-58-7	2-Chloronaphthalene	NL	NL
95-57-8	2-Chlorophenol	310,000	310,000
91-57-6	2-Methylnaphthalene	230,000	230,000
95-48-7	2-Methylphenol	310,000	310,000
88-74-4	2-Nitroaniline	39,000	39,000
88-75-5	2-Nitrophenol	NL	NL
91-94-1	3,3'-Dichlorobenzidine	1,000	1,000
99-09-2	3-Nitroaniline	NL	NL
534-52-1	4,6-Dinitro-2-methylphenol	6,000	6,000
101-55-3	4-Bromophenyl-phenylether	NL	NL
59-50-7	4-Chloro-3-methylphenol	NL	NL
106-47-8	4-Chloroaniline	NL	NL
7005-72-3	4-Chlorophenyl-phenylether	NL	NL
106-44-5	4-Methylphenol	31,000	31,000
100-01-6	4-Nitroaniline	NL	NL
100-02-7	4-Nitrophenol	NL	NL
83-32-9	Acenaphthene	3,400,000	3,400,000
208-96-8	Acenaphthylene	NL	NL
98-86-2	Acetophenone	2,000	2,000
120-12-7	Anthracene	17,000,000	17,000,000
1912-24-9	Atrazine	210,000	210,000
100-52-7	Benzaldehyde	6,100,000	6,100,000
56-55-3	Benzo(a)anthracene	600	600
50-32-8	Benzo(a)pyrene	200	200
205-99-2	Benzo(b)fluoranthene	600	600
191-24-2	Benzo(g,h,i)perylene	380,000,000	380,000,000
207-08-9	Benzo(k)fluoranthene	6,000	6,000
111-91-1	bis(2-Chloroethoxy)methane	NL	NL
111-44-4	bis(2-Chloroethyl)ether	400	400
117-81-7	bis-(2-Ethylhexyl)phthalate	35,000	35,000
85-68-7	Butylbenzylphthalate	1,200,000	1,200,000
105-60-2	Caprolactam	31,000,000	31,000,000
86-74-8	Carbazole	24,000	24,000
218-01-9	Chrysene	62,000	62,000

**TABLE 3**  
**Test Excavation Data Summary**  
**Soil Screening Criteria**  
**Raritan Bay Slag Superfund Site**  
**Old Bridge and Sayreville, NJ**

CAS Number	Chemical Name	NJDEP Residential Direct Contact Soil Remediation Standard (NJRDCSRS) <sup>1</sup>	Soil and Sediment Screening Criteria
53-70-3	Dibenzo(a,h)anthracene	200	200
132-64-9	Dibenzofuran	NL	NL
84-66-2	Diethylphthalate	49,000,000	49,000,000
131-11-3	Dimethylphthalate	NL	NL
84-74-2	Di-n-butylphthalate	6,100,000	6,100,000
117-84-0	Di-n-octylphthalate	2,400,000	2,400,000
206-44-0	Fluoranthene	2,300,000	2,300,000
86-73-7	Fluorene	2,300,000	2,300,000
118-74-1	Hexachlorobenzene	300	300
87-68-3	Hexachlorobutadiene	6,000	6,000
77-47-4	Hexachlorocyclopentadiene	45,000	45,000
67-72-1	Hexachloroethane	35,000	35,000
193-39-5	Indeno(1,2,3-cd)pyrene	600	600
78-59-1	Isophorone	510,000	510,000
91-20-3	Naphthalene	6,000	6,000
98-95-3	Nitrobenzene	31,000	31,000
621-64-7	N-Nitroso-di-n-propylamine	200	200
86-30-6	N-Nitrosodiphenylamine	99,000	99,000
87-86-5	Pentachlorophenol	3,000	3,000
85-01-8	Phenanthrene	NL	NL
108-95-2	Phenol	18,000,000	18,000,000
129-00-0	Pyrene	1,700,000	1,700,000
<b>Pesticides/Polychlorinated Biphenyls (µg/kg)</b>			
72-54-8	4,4'-DDD	3,000	3,000
72-55-9	4,4'-DDE	2,000	2,000
50-29-3	4,4'-DDT	2,000	2,000
309-00-2	Aldrin	40	40
319-84-6	alpha-BHC	100	100
5103-71-9	alpha-Chlordane	200	200
12674-11-2	Aroclor-1016	200 e	200
11104-28-2	Aroclor-1221	200 e	200
11141-16-5	Aroclor-1232	200 e	200
53469-21-9	Aroclor-1242	200 e	200
12672-29-6	Aroclor-1248	200 e	200
11097-69-1	Aroclor-1254	200 e	200
11096-82-5	Aroclor-1260	200 e	200
37324-23-5	Aroclor-1262	200 e	200
11100-14-4	Aroclor-1268	200 e	200
319-85-7	beta-BHC	400	400
319-86-8	delta-BHC	400 f	400
60-57-1	Dieldrin	40	40

**TABLE 3**  
**Test Excavation Data Summary**  
**Soil Screening Criteria**  
**Raritan Bay Slag Superfund Site**  
**Old Bridge and Sayreville, NJ**

CAS Number	Chemical Name	NJDEP Residential Direct Contact Soil Remediation Standard (NJRDCSR) <sup>1</sup>	Soil and Sediment Screening Criteria
959-98-8	Endosulfan I	470,000	470,000
33213-65-9	Endosulfan II	470,000	470,000
1031-07-8	Endosulfan Sulfate	470,000	470,000
72-20-8	Endrin	23,000	23,000
7421-93-4	Endrin aldehyde	23,000 g	23,000
53494-70-5	Endrin ketone	23,000 g	23,000
58-89-9	gamma-BHC (Lindane)	400	400
5103-74-2	gamma-Chlordane	200	200
76-44-8	Heptachlor	100	100
1024-57-3	Heptachlor epoxide	70	70
72-43-5	Methoxychlor	390,000	390,000
8001-35-2	Toxaphene	600	600

**Source:**

1 - New Jersey Department of Environmental Protection (NJDEP) Residential Direct Contact Health Based Criteria and Soil Remediation Standards. Revised November 4, 2009.  
<http://www.state.nj.us/dep/srp/guidance/rs/>. Last accessed May 25, 2010

2 - NJDEP Soil Cleanup Criteria (mg/kg), <http://www.nj.gov/dep/srp/guidance/scc/>. Revised 12 May 1999. Last accessed June 25, 2010.

mg/kg - milligram per kilogram

µg/kg - microgram per kilogram

NL - not listed

a - based on natural background levels as noted in NJDEP criteria

b - value for trivalent chromium from NJDEP Soil Cleanup Criteria (2)

c - value for hexavalent chromium from NJDEP Soil Cleanup Criteria (2)

d - applied to m,p xylene and o-xylene

e - criteria for PCBs

f - criteria for beta-BHC

g - criteria for endrin

TABLE 4  
Test Excavation Data Summary  
Soil Sample Results – Volatile Organic Compounds  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T10TP1-SS1	T10TP1-SS2	T11TP1-SS1	T11TP1-SS2	T11TP2-SS1	T11TP2-SS2	T11TP3-SS1	T11TP3-SS2	T11TP4-SS1	T11TP5-SS2
CLP Number			B7PW7	B7PW8	B7PX5	B7PX6	MB7PX9	MB7PY0	MB7PY3	MB7PY4	MB7PY7	MB7PY8
Location			T10-Test Pit1-Sample1	T10-Test Pit1-Sample2	T11-Test Pit1-Sample1	T11-Test Pit1-Sample2	T11-Test Pit2-Sample1	T11-Test Pit2-Sample2	T11-Test Pit3-Sample1	T11-Test Pit3-Sample2	T11-Test Pit4-Sample1	T11-Test Pit5-Sample2
Area			Area-01	Area-01	Area-04	Area-04	Area-04	Area-04	Area-04	Area-04	Area-04	Area-04
Date			4/28/2010	4/30/2010	4/29/2010	4/29/2010	5/4/2010	5/4/2010	5/4/2010	5/5/2010	5/5/2010	5/5/2010
Start Depth			0	4	0	5.5	0	5	0	5.5	0	7
End Depth			2	5	2	6	2	6	2.5	6	2	7.5
Depth Units			ft	ft	ft	ft	ft	ft	ft	ft	ft	ft
chemical_name	result_unit	RBS-NJDCSRS-Soil										
VOLATILE ORAGNIC COMPOUNDS												
1,1,1-Trichloroethane	µg/kg	290000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
1,1,2,2-Tetrachloroethane	µg/kg	1000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/kg	NL	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
1,1,2-Trichloroethane	µg/kg	2000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
1,1-Dichloroethane	µg/kg	8000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
1,1-Dichloroethane	µg/kg	11000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
1,2,3-Trichlorobenzene	µg/kg	NL	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
1,2,4-Trichlorobenzene	µg/kg	73000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
1,2-Dibromo-3-chloropropane	µg/kg	80	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
1,2-Dibromoethane	µg/kg	8	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
1,2-Dichlorobenzene	µg/kg	5300000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
1,2-Dichloroethane	µg/kg	900	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
1,2-Dichloropropane	µg/kg	2000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
1,3-Dichlorobenzene	µg/kg	5300000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
1,4-Dichlorobenzene	µg/kg	5000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
1,4-Dioxane	µg/kg	NL	90U	88U	110U	110U	120U	110U	110U	110U	120U	120U
2-Butanone	µg/kg	3100000	9U	8.5U	11U	11U	12U	11U	11U	11U	12U	12U
2-Hexanone	µg/kg	NL	9U	8.5U	11U	11U	12U	11U	11U	11U	12U	12U
4-Methyl-2-Pentanone	µg/kg	NL	9U	8.5U	11U	11U	12U	11U	11U	11U	12U	12U
Acetone	µg/kg	70000000	9U	8.5U	11U	11U	12U	11U	11U	11U	34	12U
Benzene	µg/kg	2000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Bromochloromethane	µg/kg	NL	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Bromodichloromethane	µg/kg	1000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Bromoform	µg/kg	81000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Bromomethane	µg/kg	25000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Carbon Disulfide	µg/kg	7800000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Carbon tetrachloride	µg/kg	600	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Chlorobenzene	µg/kg	510000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Chloroethane	µg/kg	220000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Chloroform	µg/kg	600	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Chloromethane	µg/kg	4000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
cis-1,2-Dichloroethene	µg/kg	230000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
cis-1,3-Dichloropropene	µg/kg	NL	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Cyclohexane	µg/kg	NL	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Dibromochloromethane	µg/kg	3000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Dichlorodifluoromethane	µg/kg	490000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Ethylbenzene	µg/kg	7800000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Isopropylbenzene	µg/kg	NL	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
m,p-Xylene	µg/kg	12000000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Methyl Acetate	µg/kg	78000000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Methyl tert-Butyl Ether	µg/kg	110000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Methylcyclohexane	µg/kg	NL	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Methylene chloride	µg/kg	34000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
o-Xylene	µg/kg	12000000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Styrene	µg/kg	90000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Tetrachloroethene	µg/kg	2000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Toluene	µg/kg	6300000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
trans-1,2-Dichloroethene	µg/kg	300000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
trans-1,3-Dichloropropene	µg/kg	NL	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Trichloroethene	µg/kg	7000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Trichlorofluoromethane	µg/kg	23000000	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U
Vinyl Chloride	µg/kg	700	4.5U	4.3U	5.6U	5.5U	5.9U	5.7U	5.6U	5.6U	5.8U	6U

NOTES  
\*\* in Location indicates Transect number  
CLP - Contract Laboratory Program  
RBS-NJDCSRS-Soil - NJDEP Residential Direct Contact Health Based Criteria  
and Soil Remediation Standards. Revised November 4, 2009.  
<http://www.state.nj.us/dep/srp/guidance/rsr/>. Last accessed May 25, 2010  
µg/kg - microgram per kilogram  
NL - not listed  
U - non-detect  
J - estimated data due to exceeded quality control criteria

TABLE 4  
Test Excavation Data Summary  
Soil Sample Results – Volatile Organic Compounds  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T12TP1-SS1 B7P21	T12TP1-SS2 B7P22	T12TP2-SS1 B7P25	T12TP3-SS1 B7P26	T1TP1-SS1 B7PT5	T1TP2-SS2 B7PW0	T1TP3-SS1 B7PW3	T1TP3-SS2 B7PW4	T25TP9-SS1 B7PS8	T25TP9-SS2 B7PS9
CLP Number			T12-Test Pit1-Sample1	T12-Test Pit1-Sample2	T12-Test Pit2-Sample1	T12-Test Pit3-Sample1	T1-Test Pit1-Sample1	T1-Test Pit2-Sample2	T1-Test Pit3-Sample1	T1-Test Pit3-Sample2	T1-Test Pit3-Sample2	T3-Test Pit1-Sample1
Location			Area-04	Area-04	Area-01	Area-04	Area-02	Area-02	Area-02	Area-02	Area-02	Area-01
Area			4/23/2010	4/23/2010	4/23/2010	4/23/2010	4/23/2010	4/22/2010	4/22/2010	4/22/2010	4/22/2010	4/26/2010
Start Depth			0	9.5	6.5	6	8.5	0	0	9.5	9.5	0
End Depth			2	10	7	6.5	9	2	2	10	10	2
Depth Units			ft	ft	ft	ft	ft	ft	ft	ft	ft	ft
chemical_name	result_unit	RBS-NJRDCCSR-Soil										
VOLATILE ORGANIC COMPOUNDS												
1,1,1-Trichloroethane	µg/kg	290000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
1,1,2,2-Tetrachloroethane	µg/kg	1000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/kg	NL	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
1,1,2-Trichloroethane	µg/kg	2000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
1,1-Dichloroethane	µg/kg	8000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
1,1-Dichloroethene	µg/kg	11000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
1,2,3-Trichlorobenzene	µg/kg	NL	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
1,2,4-Trichlorobenzene	µg/kg	73000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
1,2-Dibromo-3-chloropropane	µg/kg	80	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
1,2-Dibromoethane	µg/kg	8	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
1,2-Dichlorobenzene	µg/kg	5300000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
1,2-Dichloroethane	µg/kg	900	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
1,2-Dichloropropane	µg/kg	2000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
1,3-Dichlorobenzene	µg/kg	5300000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
1,4-Dichlorobenzene	µg/kg	5000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
1,4-Dioxane	µg/kg	NL	120 U	110 U	110 U	110 U	130 U	120 U	110 U	120 U	120 U	110 U
2-Butanone	µg/kg	3100000	12 U	11 U	11 U	11 U	13 U	12 U	11 U	12 U	12 U	11 U
2-Hexanone	µg/kg	NL	12 U	11 U	11 U	11 U	13 U	12 U	11 U	12 U	12 U	11 U
4-Methyl-2-Pentanone	µg/kg	NL	12 U	11 U	11 U	11 U	13 U	12 U	11 U	12 U	12 U	11 U
Acetone	µg/kg	70000000	12 U	11 U	11 U	11 U	33	12 U	11 U	76	38	11 U
Benzene	µg/kg	2000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Bromochloromethane	µg/kg	NL	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Bromodichloromethane	µg/kg	1000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Bromoform	µg/kg	81000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Bromomethane	µg/kg	25000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Carbon Disulfide	µg/kg	7800000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Carbon tetrachloride	µg/kg	600	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Chlorobenzene	µg/kg	510000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Chloroethane	µg/kg	220000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Chloroform	µg/kg	600	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Chloromethane	µg/kg	4000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
cis-1,2-Dichloroethene	µg/kg	230000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
cis-1,3-Dichloropropene	µg/kg	NL	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Cyclohexane	µg/kg	NL	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Dibromochloromethane	µg/kg	3000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Dichlorodifluoromethane	µg/kg	490000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Ethylbenzene	µg/kg	7800000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Isopropylbenzene	µg/kg	NL	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
m,p-Xylene	µg/kg	12000000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Methyl Acetate	µg/kg	78000000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Methyl tert-Butyl Ether	µg/kg	110000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Methylcyclohexane	µg/kg	NL	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Methylene chloride	µg/kg	34000	5.8 U	5.7 U	6.2	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
o-Xylene	µg/kg	12000000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Styrene	µg/kg	90000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Tetrachloroethene	µg/kg	2000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Toluene	µg/kg	6300000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
trans-1,2-Dichloroethene	µg/kg	300000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
trans-1,3-Dichloropropene	µg/kg	NL	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Trichloroethene	µg/kg	7000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Trichlorofluoromethane	µg/kg	23000000	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U
Vinyl Chloride	µg/kg	700	5.8 U	5.7 U	5.5 U	5.5 U	6.3 U	6.1 U	5.5 U	5.9 U	6 U	5.6 U

NOTES  
\*T\* In Location Indicates Transect number  
CLP - Contract Laboratory Program  
RBS-NJRDCCSR-Soil - NJDEP Residential Direct Contact Health Based Criteria  
and Soil Remediation Standards. Revised November 4, 2009.  
<http://www.state.nj.us/de/pir/guidance/rbs/>. Last accessed May 25, 2010  
µg/kg - microgram per kilogram  
NL - not listed  
U - non-detect  
J - estimated data due to exceeded quality control criteria

TABLE 4  
Test Excavation Data Summary  
Soil Sample Results – Volatile Organic Compounds  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T25TP9-SS3 B7PT0	T25TP9-SS4 B7PT1	T25TP9-SS5 MB7PT2	T25TP9-SS6 MB7PT3	T2TP1-SS1 MB7PZ9	T2TP2-SS2 B7Q04	T2TP2-SS3 B7Q05	T2TP2-SS4 B7Q06	T3TP1-SS1 B7Q07	T3TP1-SS2 B7Q08
CLP Number			T7-Test Pit1-Sample2	T10-Test Pit1-Sample1	T6-Test Pit2-Sample1	T11-Test Pit3-Sample1	T2-Test Pit1-Sample1	T2-Test Pit2-Sample2	T2-Test Pit2-Sample3	T2-Test Pit2-Sample4	T3-Test Pit1-Sample1	T3-Test Pit1-Sample2
Location			Area-01	Area-01	Area-04	Area-04	Area-02	Area-02	Area-02	Area-02	Area-01	Area-01
Date			4/28/2010	4/30/2010	5/3/2010	5/5/2010	4/21/2010	4/21/2010	4/21/2010	4/22/2010	4/26/2010	4/28/2010
Start Depth			4	0	1	0	4	7.5	6.5	0	0	4
End Depth			5	2	2	2.5	4.5	8	7	1	2	4.5
Depth Units			ft	ft	ft	ft	ft	ft	ft	ft	ft	ft
chemical_name	result_unit	RBS-NJRDCCSR-Soil										
VOLATILE ORGANIC COMPOUNDS												
1,1,1-Trichloroethane	µg/kg	290000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
1,1,2,2-Tetrachloroethane	µg/kg	1000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/kg	NL	5.5	5.7	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
1,1,2-Trichloroethane	µg/kg	2000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
1,1-Dichloroethane	µg/kg	8000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
1,1-Dichloroethene	µg/kg	11000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
1,2,3-Trichlorobenzene	µg/kg	NL	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
1,2,4-Trichlorobenzene	µg/kg	73000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
1,2-Dibromo-3-chloropropane	µg/kg	80	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
1,2-Dibromochloroethane	µg/kg	8	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
1,2-Dichlorobenzene	µg/kg	5300000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
1,2-Dichloroethane	µg/kg	900	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
1,2-Dichloropropane	µg/kg	2000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
1,3-Dichlorobenzene	µg/kg	5300000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
1,4-Dichlorobenzene	µg/kg	6000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
1,4-Dioxane	µg/kg	NL	110 U	110 U	110 U	110 U	110 U	110 U	120 U	110 U	110 U	110 U
2-Butanone	µg/kg	3100000	11 U	11 U	11 U	11 U	11 U	9.6 U	6.1 U	11 U	11 U	11 U
2-Hexanone	µg/kg	NL	11 U	11 U	11 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U
4-Methyl-2-Pentanone	µg/kg	NL	11 U	11 U	11 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U
Acetone	µg/kg	70000000	11 U	11 U	11 U	11 U	11 U	92	46	11 U	11 U	11 U
Benzene	µg/kg	2000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Bromochloromethane	µg/kg	NL	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Bromodichloromethane	µg/kg	1000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Bromofluoromethane	µg/kg	81900	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Bromomethane	µg/kg	25000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Carbon Disulfide	µg/kg	7800000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Carbon tetrachloride	µg/kg	600	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Chlorobenzene	µg/kg	510000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Chloroethane	µg/kg	220000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Chloroform	µg/kg	600	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Chloromethane	µg/kg	4000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
cis-1,2-Dichloroethene	µg/kg	230000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
cis-1,3-Dichloropropene	µg/kg	NL	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Cyclohexane	µg/kg	NL	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Dibromochloromethane	µg/kg	3000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Dichlorodifluoromethane	µg/kg	480000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Ethylbenzene	µg/kg	7800000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Isopropylbenzene	µg/kg	NL	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
m,p-Xylene	µg/kg	12000000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Methyl Acetate	µg/kg	78000000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Methyl tert-Butyl Ether	µg/kg	110000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Methylcyclohexane	µg/kg	NL	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Methylene chloride	µg/kg	34000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
o-Xylene	µg/kg	12000000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Styrene	µg/kg	90000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Tetrachloroethene	µg/kg	2000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Toluene	µg/kg	6300000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
trans-1,2-Dichloroethene	µg/kg	300000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
trans-1,3-Dichloropropene	µg/kg	NL	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Trichloroethane	µg/kg	7000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Trichlorofluoromethane	µg/kg	23000000	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U
Vinyl Chloride	µg/kg	700	5.5 U	5.7 U	5.7 U	5.6 U	5.5 U	5.7 U	6 U	5.3 U	5.6 U	5.6 U

NOTES  
\*T\* in Location indicates Transect number  
CLP - Contract Laboratory Program  
RBS-NJRDCCSR-Soil - NJDEP Residential Direct Contact Health Based Criteria and Soil Remediation Standards. Revised November 4, 2009.  
<http://www.state.nj.us/de/p/srp/guidance/crsl/>. Last accessed May 25, 2010  
µg/kg - microgram per kilogram  
NL - not listed  
U - non-detect  
J - estimated data due to exceeded quality control criteria

TABLE 4  
Test Excavation Data Summary  
Soil Sample Results – Volatile Organic Compounds  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T3TP1-SS3 B7Q09	T4TP1-SS1 B7Q15	T4TP1-SS2 B7Q16	T4TP2-SS1 MB7Q19	T4TP2-SS2 MB7Q20	T5TP1-SS1 B7Q23	T5TP1-SS2 B7Q24	T6TP1-SS1 B7Q31	T6TP1-SS2 B7Q32	T6TP2-SS1 MB7Q35
CLP Number			T3-Test Pit1-Sample3	T4-Test Pit1-Sample1	T4-Test Pit1-Sample2	T4-Test Pit2-Sample1	T4-Test Pit2-Sample2	T5-Test Pit1-Sample1	T5-Test Pit1-Sample2	T6-Test Pit1-Sample1	T6-Test Pit1-Sample2	T6-Test Pit2-Sample1
Location			Area-01	Area-01	Area-01	Area-04	Area-04	Area-01	Area-01	Area-01	Area-01	Area-04
Date			4/26/2010	4/26/2010	4/26/2010	5/3/2010	5/3/2010	4/29/2010	4/29/2010	4/27/2010	4/27/2010	5/3/2010
Start Depth			7.5	0	8	0	5	0	6		4	1
End Depth			8	2	8.5	2	6	2	7		4.5	2
Depth Units			ft	ft	ft	ft	ft	ft	ft		ft	ft
chemical_name	result_unit	RBS-NJRDCCSRs-Soil										
VOLATILE ORGANIC COMPOUNDS												
1,1,1-Trichloroethane	µg/kg	290000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 UJ	6.2 U	5.8 U	5.6 U	5.6 U
1,1,2,2-Tetrachloroethane	µg/kg	1000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.8 U	6.2 U	5.8 U	5.6 U	5.6 U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/kg	NL	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 UJ	6.2 U	5.8 U	5.6 U	5.6 U
1,1,2-Trichloroethane	µg/kg	2000	5.8 UJ	5.7 UJ	5.7 U	5.4 U	6.1 U	5.6 UJ	6.2 UJ	5.8 U	5.6 U	5.6 U
1,1-Dichloroethane	µg/kg	8000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
1,1-Dichloroethene	µg/kg	11000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
1,2,3-Trichlorobenzene	µg/kg	NL	5.7 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
1,2,4-Trichlorobenzene	µg/kg	73000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 UJ	5.6 U
1,2-Dibromo-3-chloropropane	µg/kg	80	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
1,2-Dibromoethane	µg/kg	8	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 UJ	6.2 U	5.8 U	5.6 U	5.6 U
1,2-Dichlorobenzene	µg/kg	5300000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
1,2-Dichloroethane	µg/kg	900	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 UJ	6.2 U	5.8 U	5.6 U	5.6 U
1,2-Dichloropropane	µg/kg	2000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
1,3-Dichlorobenzene	µg/kg	5300000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
1,4-Dichlorobenzene	µg/kg	5000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
1,4-Dioxane	µg/kg	NL	120 U	110 U	110 U	110 U	120 U	110 U	120 U	120 U	110 U	110 U
2-Butanone	µg/kg	3100000	12 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	11 U	11 U
2-Hexanone	µg/kg	NL	12 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	11 U	11 U
4-Methyl-2-Pentanone	µg/kg	NL	12 U	11 U	11 U	11 U	12 U	11 U	12 U	12 U	11 U	11 U
Acetone	µg/kg	70000000	12 U	11 U	11 U	10 U	12 U	11 U	12 U	12 U	11 U	11 U
Benzene	µg/kg	2000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
Bromochloromethane	µg/kg	NL	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
Bromodichloromethane	µg/kg	1000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
Bromoform	µg/kg	81000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
Bromomethane	µg/kg	25000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
Carbon Disulfide	µg/kg	7900000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
Carbon tetrachloride	µg/kg	600	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 UJ	6.2 U	5.8 U	5.6 U	5.6 U
Chlorobenzene	µg/kg	510000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
Chloroethane	µg/kg	220000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
Chloroform	µg/kg	600	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
Chloromethane	µg/kg	4000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
cis-1,2-Dichloroethene	µg/kg	230000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
cis-1,3-Dichloropropene	µg/kg	NL	5.8 UJ	5.7 UJ	5.7 U	5.4 U	6.1 U	5.6 UJ	6.2 UJ	5.8 U	5.6 U	5.6 U
Cyclohexane	µg/kg	NL	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
Dibromochloromethane	µg/kg	3000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
Dichlorodifluoromethane	µg/kg	480000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
Ethylbenzene	µg/kg	7800000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
Isopropylbenzene	µg/kg	NL	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
m,p-Xylene	µg/kg	12000000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
Methyl Acetate	µg/kg	78000000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 UJ	6.2 U	5.8 U	5.6 U	5.6 U
Methyl tert-Butyl Ether	µg/kg	110000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 UJ	6.2 U	5.8 U	5.6 U	5.6 U
Methylcyclohexane	µg/kg	NL	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
Methylene chloride	µg/kg	34000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 UJ	6.2 U	5.8 U	5.6 U	5.6 U
o-Xylene	µg/kg	12000000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
Styrene	µg/kg	90000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
Tetrachloroethene	µg/kg	2000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
Toluene	µg/kg	6300000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
trans-1,2-Dichloroethene	µg/kg	300000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
trans-1,3-Dichloropropene	µg/kg	NL	5.8 UJ	5.7 UJ	5.7 U	5.4 U	6.1 U	5.6 UJ	6.2 UJ	5.8 U	5.6 U	5.6 U
Trichloroethene	µg/kg	7000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 U	6.2 U	5.8 U	5.6 U	5.6 U
Trichlorofluoromethane	µg/kg	23000000	5.8 U	5.7 U	5.7 U	5.4 U	6.1 U	5.6 UJ	6.2 U	5.8 U	5.6 U	5.6 U
Vinyl Chloride	µg/kg	700	5.8 U	5.7 UJ	5.7 U	5.4 U	6.1 U	5.6 UJ	6.2 UJ	5.8 UJ	5.6 U	5.6 U

NOTES

\*" in Location indicates Transect number

CLP - Contract Laboratory Program

RBS-NJRDCCSRs-Soil - NJDEP Residential Direct Contact Health Based Criteria  
and Soil Remediation Standards. Revised November 4, 2009.

<http://www.state.nj.us/depr/sr/guidance/rsr/>. Last accessed May 25, 2010

µg/kg - microgram per kilogram

NL - not listed

U - non-detect

J - estimated data due to exceeded quality control criteria

TABLE 4  
Test Excavation Data Summary  
Soil Sample Results – Volatile Organic Compounds  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T8TP2-SS2	T7TP1-SS1	T7TP1-SS2	T8TP1-SS1	T8TP2-SS1	T8TP2-SS2	T8TP3-SS1	T8TP3-SS2	T9TP1-SS1	T9TP2-SS1	T9TP2-SS2
CLP Number			MB7Q38	B7Q43	B7Q44	B7Q51	MB7Q55	MB7Q56	MB7Q59	MB7Q60	B7Q63	B7Q67	B7Q68
Location			T6-Test Pit1-Sample2	T7-Test Pit1-Sample1	T7-Test Pit1-Sample2	T8-Test Pit1-Sample1	T8-Test Pit2-Sample1	T8-Test Pit2-Sample2	T8-Test Pit3-Sample1	T8-Test Pit3-Sample2	T9-Test Pit1-Sample1	T9-Test Pit2-Sample1	T9-Test Pit2-Sample2
Area			Area-04	Area-01	Area-01	Area-01	Area-04	Area-04	Area-04	Area-04	Area-01	Area-04	Area-01
Date			5/3/2010	4/28/2010	4/28/2010	4/27/2010	5/4/2010	5/4/2010	5/4/2010	5/4/2010	4/27/2010	4/28/2010	4/28/2010
Start Depth			4	0	4	5	0	7	2	4	5	1	0
End Depth			5	2	5	6	2	9	2.5	4.5	5.5	2	1.25
Depth Units			ft	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft
chemical name	result	unit	RBS-NJRDCCSR-Soil										
VOLATILE ORGANIC COMPOUNDS													
1,1,1-Trichloroethane	µg/kg	290000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
1,1,2,2-Tetrachloroethane	µg/kg	1000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/kg	NL	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
1,1,2-Trichloroethane	µg/kg	2000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
1,1-Dichloroethane	µg/kg	8000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
1,1-Dichloroethene	µg/kg	11000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
1,2,3-Trichlorobenzene	µg/kg	NL	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
1,2,4-Trichlorobenzene	µg/kg	73000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
1,2-Dibromo-3-chloropropane	µg/kg	80	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
1,2-Dibromoethane	µg/kg	8	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
1,2-Dichlorobenzene	µg/kg	5300000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
1,2-Dichloroethane	µg/kg	900	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
1,2-Dichloropropane	µg/kg	2000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
1,3-Dichlorobenzene	µg/kg	5300000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
1,4-Dichlorobenzene	µg/kg	5000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
1,4-Dioxane	µg/kg	NL	110 U	110 U	110 U	110 U	110 U	120 U	110 U	110 U	110 U	120 U	110 U
2-Butanone	µg/kg	3100000	11 U	11 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U
2-Hexanone	µg/kg	NL	11 U	11 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U
4-Methyl-2-Pentanone	µg/kg	NL	11 U	11 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U
Acetone	µg/kg	70000000	11 U	11 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U
Benzene	µg/kg	2000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Bromochloromethane	µg/kg	NL	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Bromodichloromethane	µg/kg	1000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Bromoform	µg/kg	81000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Bromomethane	µg/kg	25000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Carbon Disulfide	µg/kg	7800000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Carbon tetrachloride	µg/kg	600	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Chlorobenzene	µg/kg	510000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Chloroethane	µg/kg	220000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Chloroform	µg/kg	600	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Chloromethane	µg/kg	4000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
cis-1,2-Dichloroethane	µg/kg	230000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
cis-1,3-Dichloropropene	µg/kg	NL	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Cyclohexane	µg/kg	NL	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Dibromochloromethane	µg/kg	3000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Dichlorodifluoromethane	µg/kg	490000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Ethylbenzene	µg/kg	7800000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Isopropylbenzene	µg/kg	NL	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
m,p-Xylene	µg/kg	12000000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Methyl Acetate	µg/kg	78000000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Methyl tert-Butyl Ether	µg/kg	110000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Methylcyclohexane	µg/kg	NL	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Methylene chloride	µg/kg	34000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
o-Xylene	µg/kg	12000000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Styrene	µg/kg	90000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Tetrachloroethene	µg/kg	2000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Toluene	µg/kg	6300000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
trans-1,2-Dichloroethene	µg/kg	300000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
trans-1,3-Dichloropropene	µg/kg	NL	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Trichloroethene	µg/kg	7000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Trichlorofluoromethane	µg/kg	23000000	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U
Vinyl Chloride	µg/kg	700	5.3 U	5.4 U	5.7 U	5.4 U	5.3 U	5.9 U	5.5 U	5.5 U	5.3 U	5.8 U	5.5 U

NOTES  
T\* in Location indicates Transect number  
CLP - Contract Laboratory Program  
RBS-NJRDCCSR-Soil - NJDEP Residential Direct Contact Health Based Criteria  
and Soil Remediation Standards. Revised November 4, 2009.  
<http://www.state.nj.us/dep/srp/guidance/rs/>. Last accessed May 26, 2010  
µg/kg - microgram per kilogram  
NL - not listed  
U - non-detect  
J - estimated data due to exceeded quality control criteria

TABLE 5  
Test Excavation Data Summary  
Soil Sample Results – Semi-volatile Organic Compounds  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T10TP1-SS1	T10TP1-SS2	T11TP1-SS1	T11TP1-SS2	T11TP2-SS1
CLP Number			B7PW7	B7PW8	B7PX5	B7PX6	MB7PX9
Location			T10-Test Pit1-Sample1	T10-Test Pit1-Sample2	T11-Test Pit1-Sample1	T11-Test Pit1-Sample2	T11-Test Pit2-Sample1
Area			Area-01	Area-01	Area-04	Area-04	Area-04
Date			4/28/2010	4/30/2010	4/29/2010	4/29/2010	5/4/2010
Start Depth			0	4	0	5.5	0
End Depth			2	5	2	6	2
Depth Units			ft	ft	ft	ft	ft
chemical_name	units	RBS-NJRDCSRs-Soil					
SEMIVOLATILE ORGANIC COMPOUNDS							
1,1'-Biphenyl	µg/kg	3100000	190 U	4.1 J	190 U	190 U	200 U
1,2,4,5-Tetrachlorobenzene	µg/kg	NL	190 U	190 U	190 U	190 U	200 U
2,4,5-Trichlorophenol	µg/kg	6100000	190 U	190 U	190 U	190 U	200 U
2,4,6-Trichlorophenol	µg/kg	19000	190 U	190 U	190 U	190 U	200 U
2,4-Dichlorophenol	µg/kg	180000	190 U	190 U	190 U	190 U	200 U
2,4-Dimethylphenol	µg/kg	1200000	37 U	37 U	37 U	36 U	39 U
2,4-Dinitrophenol	µg/kg	120000	68 U	68 U	69 U	67 U	72 U
2,4-Dinitrotoluene	µg/kg	700	37 U	44 J	37 U	36 U	39 U
2,6-Dinitrotoluene	µg/kg	700	190 U	60 J	190 U	190 U	200 U
2-Chloronaphthalene	µg/kg	NL	37 U	4.4 J	37 U	36 U	39 U
2-Chlorophenol	µg/kg	310000	190 U	190 U	190 U	190 U	200 U
2-Methylnaphthalene	µg/kg	230000	190 U	190 U	190 U	190 U	200 U
2-Methylnaphthalene (SIM)	µg/kg	230000	3.7 U	3.7 U	2.1 J	3.6 U	3.9 U
2-Methylphenol	µg/kg	310000	190 U	190 U	190 U	190 U	200 U
2-Nitroaniline	µg/kg	39000	370 U	9.2 J	370 U	360 U	390 U
2-Nitrophenol	µg/kg	NL	190 U	190 U	190 U	190 U	200 U
3,3'-Dichlorobenzidine	µg/kg	1000	190 U	190 U	190 U	190 U	200 U
3-Nitroaniline	µg/kg	NL	370 U	92 J	370 U	360 U	390 U
4,6-Dinitro-2-Methylphenol	µg/kg	6000	160 U	160 U	160 U	150 U	170 U
4-Bromophenyl Phenyl Ether	µg/kg	NL	190 U	190 U	190 U	190 U	200 U
4-Chloro-3-Methylphenol	µg/kg	NL	190 U	190 U	190 U	190 U	200 U
4-Chloroaniline	µg/kg	NL	190 U	190 U	190 U	190 U	200 U
4-Chlorophenyl Phenylether	µg/kg	NL	190 U	190 U	190 U	190 U	200 U
4-Methylphenol	µg/kg	31000	190 U	190 U	190 U	190 U	200 U
4-Nitroaniline	µg/kg	NL	370 U	370 U	370 U	360 U	390 U
4-Nitrophenol	µg/kg	NL	370 U	43 J	370 U	360 U	390 U
Acenaphthene	µg/kg	3400000	190 U	190 U	190 U	190 U	200 U
Acenaphthene (SIM)	µg/kg	NL	3.7 U	3.7 U	3.7 U	3.6 U	3.9 U
Acenaphthylene	µg/kg	NL	190 U	190 U	190 U	190 U	200 U
Acenaphthylene (SIM)	µg/kg	17000000	3.7 U	3.7 U	3.7 U	3.6 U	2.2 J
Acetophenone	µg/kg	2000	190 U	190 U	190 U	190 U	200 U
Anthracene	µg/kg	17000000	190 U	190 U	190 U	190 U	200 U
Anthracene (SIM)	µg/kg	3400000	3.7 U	3.7 U	3.7 U	3.6 U	2.3 J
Atrazine	µg/kg	210000	190 U	190 U	190 U	190 U	200 U
Benzaldehyde	µg/kg	6100000	190 U	190 U	190 U	190 U	200 U
Benzo(a)anthracene	µg/kg	600	170 U	170 U	170 U	170 U	180 U
Benzo(a)anthracene (SIM)	µg/kg	600	3.7 U	3.7 U	3.7 U	3.6 U	18
Benzo(a)pyrene	µg/kg	200	37 U	37 U	37 U	36 U	39 U
Benzo(a)pyrene (SIM)	µg/kg	200	3.7 U	3.7 U	3.7 U	3.6 U	18
Benzo(b)fluoranthene	µg/kg	600	170 U	170 U	170 U	170 U	180 U
Benzo(b)fluoranthene (SIM)	µg/kg	600	4.1	3.2 J	2 J	3.6 U	22
Benzo(g,h,i)perylene	µg/kg	380000000	190 U	190 U	190 U	190 U	200 U
Benzo(g,h,i)perylene (SIM)	µg/kg	380000000	4.5	4	3.7 U	3.6 U	9.8
Benzo(k)fluoranthene	µg/kg	6000	190 U	190 U	190 U	190 U	200 U
Benzo(k)fluoranthene (SIM)	µg/kg	6000	1.9 J	1.7 J	3.7 U	3.6 U	12
Bis(2-Chloroethoxy) methane	µg/kg	NL	190 U	190 U	190 U	190 U	200 U
Bis(2-Chloroethyl) ether	µg/kg	400	190 U	190 U	190 U	190 U	200 U
Bis(2-Ethylhexyl) phthalate	µg/kg	35000	190 U	190 U	190 U	190 U	20 J
Bis-Chloroisopropyl ether	µg/kg	23000	190 U	190 U	190 U	190 U	200 U
Butylbenzylphthalate	µg/kg	1200000	190 U	190 U	190 U	190 U	200 U
Caprolactam	µg/kg	31000000	190 U	190 U	190 U	190 U	200 U
Carbazole	µg/kg	24000	190 U	190 U	190 U	190 U	200 U
Chlorophenols	µg/kg	NL	190 U	190 U	190 U	190 U	200 U
Chrysene	µg/kg	62000	190 U	190 U	190 U	190 U	200 U
Chrysene (SIM)	µg/kg	62000	3.7 U	3.7 U	3.7 U	3.6 U	17
Dibenzo(a,h)anthracene	µg/kg	200	37 U	37 U	37 U	36 U	39 U
Dibenzo(a,h)anthracene (SIM)	µg/kg	200	3.7 U	3.7 U	3.7 U	3.6 U	4.7 UJ
Dibenzofuran	µg/kg	NL	190 U	190 U	190 U	190 U	200 U
Diethylphthalate	µg/kg	49000000	190 U	190 U	190 U	190 U	200 U
Dimethylphthalate	µg/kg	NL	190 U	18 J	190 U	190 U	200 U
Di-N-Butylphthalate	µg/kg	6100000	170 U	8.5 J	170 U	170 U	180 U
Di-N-Octyl Phthalate	µg/kg	2400000	190 U	5.9 J	190 U	190 U	200 U
Fluoranthene	µg/kg	2300000	190 U	190 U	190 U	190 U	32 J
Fluoranthene (SIM)	µg/kg	2300000	2.7 J	1.9 J	2.1 J	3.6 U	29
Fluorene	µg/kg	2300000	190 U	190 U	190 U	190 U	200 U
Fluorene (SIM)	µg/kg	2300000	3.7 U	3.7 U	3.7 U	3.6 U	3.9 U
Hexachlorobenzene	µg/kg	300	190 U	190 U	190 U	190 U	200 U
Hexachlorobutadiene	µg/kg	6000	45 U	44 U	45 U	44 U	47 U
Hexachlorocyclopentadiene	µg/kg	45000	190 U	190 U	190 U	190 U	200 U
Hexachloroethane	µg/kg	35000	190 U	190 U	190 U	190 U	200 U
Indeno(1,2,3-Cd)Pyrene	µg/kg	600	170 U	176 U	170 U	170 U	180 U
Indeno(1,2,3-Cd)Pyrene (SIM)	µg/kg	600	4.6 J	4.8 J	3.8 J	4 J	14
Isophorone	µg/kg	510000	190 U	15 J	190 U	190 U	200 U
Naphthalene	µg/kg	6000	190 U	190 U	190 U	190 U	200 U
Naphthalene (SIM)	µg/kg	6000	3.7 U	1.8 J	3.6 J	3.6 U	3.9 U
Nitrobenzene	µg/kg	31000	190 U	190 U	190 U	190 U	200 U
N-Nitroso-Di-N-Propylamine	µg/kg	200	77 U	16 J	78 U	76 U	81 U
N-Nitrosodiphenylamine	µg/kg	99000	190 U	190 U	190 U	190 U	200 U
Pentachlorophenol	µg/kg	3000	130 U	130 U	140 U	130 U	140 U
Pentachlorophenol (SIM)	µg/kg	3000	7.5 R	7.4 R	7.5 R	7.4 R	7.9 R
Phenanthrene	µg/kg	NL	190 U	190 U	190 U	190 U	200 U
Phenanthrene (SIM)	µg/kg	NL	1.8 J	3.7 U	3 J	3.6 U	13
Phenol	µg/kg	18000000	190 U	190 U	190 U	190 U	200 U
Pyrene	µg/kg	1700000	190 U	190 U	190 U	190 U	31 J
Pyrene (SIM)	µg/kg	1700000	4.4	3.4 J	2.9 J	3.6 U	35

NOTES  
SIM - SVOCs were analyzed by low level analysis and by SIM analysis to meet the project action criteria listed in the QAPP  
"T" in Location Indicates Transect number  
CLP - Contract Laboratory Program  
Exceedances highlighted in blue.  
RBS-NJRDCSRs-Soil - NJDEP Residential Direct Contact Health Based Criteria and Soil Remediation Standards. Revised November 4, 2009.  
<http://www.state.nj.us/dep/srp/guidance/rs/>. Last accessed May 25, 2010

TABLE 5  
Test Excavation Data Summary  
Soil Sample Results – Semi-volatile Organic Compounds  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T11TP2-SS2	T11TP3-SS1	T11TP3-SS2	T11TP4-SS1	T11TP5-SS2
CLP Number			MB7PY0	MB7PY3	MB7PY4	MB7PY7	MB7PY8
Location			T11-Test Pit2-Sample2	T11-Test Pit3-Sample1	T11-Test Pit3-Sample2	T11-Test Pit4-Sample1	T11-Test Pit5-Sample2
Area			Area-04	Area-04	Area-04	Area-04	Area-04
Date			5/4/2010	5/4/2010	5/5/2010	5/5/2010	5/5/2010
Start Depth			5	0	5.5	0	7
End Depth			6	2.5	6	2	7.5
Depth Units			ft	ft	ft	ft	ft
chemical_name	units	RBS-NJRDCSRS-Soil					
SEMIVOLATILE ORGANIC COMPOUNDS							
1,1'-Biphenyl	µg/kg	3100000	190 U	190 U	190 U	200 U	210 U
1,2,4,6-Tetrachlorobenzene	µg/kg	NL	190 U	190 U	190 U	200 U	210 U
2,4,5-Trichlorophenol	µg/kg	6100000	190 U	190 U	190 U	200 U	210 U
2,4,6-Trichlorophenol	µg/kg	19000	190 U	190 U	190 U	200 U	210 U
2,4-Dichlorophenol	µg/kg	180000	190 U	190 U	190 U	200 U	210 U
2,4-Dimethylphenol	µg/kg	1200000	38 U	37 U	37 U	38 U	40 U
2,4-Dinitrophenol	µg/kg	120000	70 U	68 U	68 U	70 U	74 U
2,4-Dinitrotoluene	µg/kg	700	38 U	37 U	37 U	38 U	40 U
2,6-Dinitrotoluene	µg/kg	700	190 U	190 U	190 U	200 U	210 U
2-Chloronaphthalene	µg/kg	NL	38 U	37 U	37 U	38 U	40 U
2-Chlorophenol	µg/kg	310000	190 U	190 U	190 U	200 U	210 U
2-Methylnaphthalene	µg/kg	230000	190 U	190 U	190 U	200 U	210 U
2-Methylnaphthalene (SIM)	µg/kg	230000	3.8 U	3.7 U	3.7 U	3.8 U	4 U
2-Methylphenol	µg/kg	310000	190 U	190 U	190 U	200 U	210 U
2-Nitroaniline	µg/kg	39000	380 U	370 U	370 U	380 U	400 U
2-Nitrophenol	µg/kg	NL	190 U	190 U	190 U	200 U	210 U
3,3'-Dichlorobenzidine	µg/kg	1000	190 U	190 U	190 U	200 U	210 U
3-Nitroaniline	µg/kg	NL	380 U	370 U	370 U	380 U	400 U
4,6-Dinitro-2-Methylphenol	µg/kg	6000	160 U	160 U	160 U	160 U	170 U
4-Bromophenyl Phenyl Ether	µg/kg	NL	190 U	190 U	190 U	200 U	210 U
4-Chloro-3-Methylphenol	µg/kg	NL	190 U	190 U	190 U	200 U	210 U
4-Chloroaniline	µg/kg	NL	190 U	190 U	190 U	200 U	210 U
4-Chlorophenyl Phenylether	µg/kg	NL	190 U	190 U	190 U	200 U	210 U
4-Methylphenol	µg/kg	31000	190 U	190 U	190 U	200 U	210 U
4-Nitroaniline	µg/kg	NL	380 U	370 U	370 U	380 U	400 U
4-Nitrophenol	µg/kg	NL	380 U	370 U	370 U	380 U	400 U
Acenaphthene	µg/kg	3400000	190 U	190 U	190 U	200 U	210 U
Acenaphthene (SIM)	µg/kg	NL	3.8 U	3.7 U	3.7 U	3.8 U	4 U
Acenaphthylene	µg/kg	NL	190 U	190 U	190 U	200 U	210 U
Acenaphthylene (SIM)	µg/kg	17000000	3.8 U	3.7 U	3.7 U	3.8 U	4 U
Acetophenone	µg/kg	2000	190 U	190 U	190 U	200 U	210 U
Anthracene	µg/kg	17000000	190 U	190 U	190 U	200 U	210 U
Anthracene (SIM)	µg/kg	3400000	3.8 U	3.7 U	3.7 U	3.8 U	4 U
Atrazine	µg/kg	210000	190 U	190 U	190 U	200 U	210 U
Benzaldehyde	µg/kg	6100000	190 U	190 U	190 U	200 U	210 U
Benzo(a)anthracene	µg/kg	600	170 U	170 U	170 U	170 U	180 U
Benzo(a)anthracene (SIM)	µg/kg	600	3.8 U	3.4 J	3.7 U	3.8 U	4 U
Benzo(a)pyrene	µg/kg	200	38 U	37 U	37 U	38 U	40 U
Benzo(a)pyrene (SIM)	µg/kg	200	3.8 U	7	3.7 U	3.8 U	4 U
Benzo(b)fluoranthene	µg/kg	600	170 U	170 U	170 U	170 U	180 U
Benzo(b)fluoranthene (SIM)	µg/kg	600	3.8 U	6	1.8 J	3.8 U	4 U
Benzo(g,h,i)perylene	µg/kg	380000000	190 U	190 U	190 U	200 U	210 U
Benzo(g,h,i)perylene (SIM)	µg/kg	380000000	3.8 U	5.4	3.7 U	3.8 U	4 U
Benzo(k)fluoranthene	µg/kg	6000	190 U	190 U	190 U	200 U	210 U
Benzo(k)fluoranthene (SIM)	µg/kg	6000	3.8 U	3.7 J	1.1 J	3.8 U	4 U
Bis(2-Chloroethoxy) methane	µg/kg	NL	190 U	190 U	190 U	200 U	210 U
Bis(2-Chloroethyl) ether	µg/kg	400	190 U	190 U	190 U	200 U	210 U
Bis(2-Ethylhexyl) phthalate	µg/kg	35000	20 J	49 J	19 J	200 U	21 J
Bis-Chloroisopropyl ether	µg/kg	23000	190 U	190 U	190 U	200 U	210 U
Butylbenzylphthalate	µg/kg	1200000	190 U	190 U	190 U	200 U	210 U
Caprolactam	µg/kg	31000000	190 U	190 U	190 U	200 U	210 U
Carbazole	µg/kg	24000	190 U	190 U	190 U	200 U	210 U
Chlorophenols	µg/kg	NL	190 U	190 U	190 U	200 U	210 U
Chrysene	µg/kg	62000	190 U	190 U	190 U	200 U	210 U
Chrysene (SIM)	µg/kg	62000	3.8 U	4.5	3.7 U	3.8 U	4 U
Dibenzo(a,h)anthracene	µg/kg	200	38 U	37 U	37 U	38 U	40 U
Dibenzo(a,h)anthracene (SIM)	µg/kg	200	3.8 UJ	3.7 UJ	3.7 UJ	3.8 UJ	4 UJ
Dibenzofuran	µg/kg	NL	190 U	190 U	190 U	200 U	210 U
Diethylphthalate	µg/kg	49000000	190 U	190 U	190 U	200 U	210 U
Dimethylphthalate	µg/kg	NL	190 U	190 U	190 U	200 U	210 U
Di-N-Butylphthalate	µg/kg	6100000	170 U	170 U	170 U	170 U	180 U
Di-N-Octyl Phthalate	µg/kg	2400000	190 U	190 U	190 U	200 U	210 U
Fluoranthene	µg/kg	2300000	190 U	190 U	190 U	200 U	210 U
Fluoranthene (SIM)	µg/kg	2300000	2.4 J	4.6	2.5 J	3.8 U	2 J
Fluorene	µg/kg	2300000	190 U	190 U	190 U	200 U	210 U
Fluorene (SIM)	µg/kg	2300000	3.8 U	3.7 U	3.7 U	3.8 U	4 U
Hexachlorobenzene	µg/kg	300	190 U	190 U	190 U	200 U	210 U
Hexachlorobutadiene	µg/kg	6000	46 U	44 U	44 U	46 U	48 U
Hexachlorocyclopentadiene	µg/kg	45000	190 U	190 U	190 U	200 U	210 U
Hexachloroethane	µg/kg	35000	190 U	190 U	190 U	200 U	210 U
Indeno(1,2,3-Cd)Pyrene	µg/kg	600	170 U	170 U	170 U	170 U	180 U
Indeno(1,2,3-Cd)Pyrene (SIM)	µg/kg	600	3.8 U	5.4 U	3.7 U	3.8 U	4 U
Isophorone	µg/kg	510000	190 U	190 U	190 U	200 U	210 U
Naphthalene	µg/kg	6000	190 U	190 U	190 U	200 U	210 U
Naphthalene (SIM)	µg/kg	6000	3.8 U	3.7 U	3.7 U	3.8 U	4 U
Nitrobenzene	µg/kg	31000	190 U	190 U	190 U	200 U	210 U
N-Nitroso-Di-N-Propylamine	µg/kg	200	79 U	77 U	76 U	80 U	83 U
N-Nitrosodiphenylamine	µg/kg	99000	190 U	190 U	190 U	200 U	210 U
Pentachlorophenol	µg/kg	3000	140 U	130 U	130 U	140 U	140 U
Pentachlorophenol (SIM)	µg/kg	3000	7.6 R	7.5 R	7.4 R	7.7 R	8.1 R
Phenanthrene	µg/kg	NL	190 U	190 U	190 U	200 U	210 U
Phenanthrene (SIM)	µg/kg	NL	2.9 J	3 J	3.6 J	3.8 U	3.1 J
Phenol	µg/kg	18000000	190 U	190 U	190 U	200 U	210 U
Pyrene	µg/kg	1700000	190 U	190 U	190 U	200 U	210 U
Pyrene (SIM)	µg/kg	1700000	3 J	8.2	3.7	3.8 U	2.8 J

NOTES

SIM - SVOCs were analyzed by low level analysis and by SIM analysis to meet the project action criteria listed in the QAPP

"T" in Location Indicates Transect number

CLP - Contract Laboratory Program

Exceedances highlighted in blue.

RBS-NJRDCSRS-Soil - NJDEP Residential Direct Contact Health Based Criteria and Soil Remediation Standards. Revised November 4, 2009.

<http://www.state.nj.us/dep/srp/guidance/rs/>. Last accessed May 25, 2010

TABLE 5  
Test Excavation Data Summary  
Soil Sample Results – Semi-volatile Organic Compounds  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T12TP1-SS1	T12TP1-SS2	T12TP2-SS1	T12TP3-SS1	T1TP1-SS1
CLP Number			B7PZ1	B7PZ2	B7PZ5	B7PZ6	B7PT5
Location			T12-Test Pit1-Sample1	T12-Test Pit1-Sample2	T12-Test Pit2-Sample1	T12-Test Pit3-Sample1	T1-Test Pit1-Sample1
Area			Area-04	Area-04	Area-01	Area-04	Area-02
Date			4/23/2010	4/23/2010	4/23/2010	4/23/2010	4/22/2010
Start Depth			0	9.5	6.5	6	8.5
End Depth			2	10	7	6.5	9
Depth Units			ft	ft	ft	ft	ft
chemical_name	units	RBS-NJRDCSRS-Soil					
SEMIVOLATILE ORGANIC COMPOUNDS							
1,1'-Biphenyl	µg/kg	3100000	200 U	190 U	190 U	190 U	210 U
1,2,4,5-Tetrachlorobenzene	µg/kg	NL	200 U	190 U	190 U	190 U	210 U
2,4,5-Trichlorophenol	µg/kg	6100000	200 U	190 U	190 U	190 U	210 U
2,4,6-Trichlorophenol	µg/kg	19000	200 U	190 U	190 U	190 U	210 U
2,4-Dichlorophenol	µg/kg	180000	200 U	190 U	190 U	190 U	210 U
2,4-Dimethylphenol	µg/kg	1200000	39 U	37 U	36 U	37 U	42 U
2,4-Dinitrophenol	µg/kg	120000	71 U	69 U	67 U	68 U	77 U
2,4-Dinitrotoluene	µg/kg	700	39 U	37 U	36 U	37 U	42 U
2,6-Dinitrotoluene	µg/kg	700	200 U	190 U	190 U	190 U	210 U
2-Chloronaphthalene	µg/kg	NL	39 U	37 U	36 U	37 U	42 U
2-Chlorophenol	µg/kg	310000	200 U	190 U	190 U	190 U	210 U
2-Methylnaphthalene	µg/kg	230000	200 U	190 U	190 U	190 U	210 U
2-Methylnaphthalene (SIM)	µg/kg	230000	3.9 U	3.7 U	3.5 J	3.7 U	2 J
2-Methylphenol	µg/kg	310000	200 U	190 U	190 U	190 U	210 U
2-Nitroaniline	µg/kg	39000	390 U	370 U	360 U	370 U	420 U
2-Nitrophenol	µg/kg	NL	200 U	190 U	190 U	190 U	210 U
3,3'-Dichlorobenzidine	µg/kg	1000	200 U	190 U	190 U	190 U	210 U
3-Nitroaniline	µg/kg	NL	390 U	370 U	360 U	370 U	420 U
4,6-Dinitro-2-Methylphenol	µg/kg	6000	160 U	160 U	150 U	160 U	180 U
4-Bromophenyl Phenyl Ether	µg/kg	NL	200 U	190 U	190 U	190 U	210 U
4-Chloro-3-Methylphenol	µg/kg	NL	200 U	190 U	190 U	190 U	210 U
4-Chloroaniline	µg/kg	NL	200 U	190 U	190 U	190 U	210 U
4-Chlorophenyl Phenylether	µg/kg	NL	200 U	190 U	190 U	190 U	210 U
4-Methylphenol	µg/kg	31000	200 U	190 U	190 U	190 U	210 U
4-Nitroaniline	µg/kg	NL	390 U	370 U	360 U	370 U	420 U
4-Nitrophenol	µg/kg	NL	390 U	370 U	360 U	370 U	420 U
Acenaphthene	µg/kg	3400000	200 U	190 U	29 J	190 U	210 U
Acenaphthene (SIM)	µg/kg	NL	3.9 U	3.7 U	30	3.7 U	7
Acenaphthylene	µg/kg	NL	200 U	190 U	190 U	190 U	210 U
Acenaphthylene (SIM)	µg/kg	17000000	3.9 U	3.7 U	3.6 U	3.7 U	4.2 U
Acetophenone	µg/kg	2000	200 U	190 U	190 U	190 U	210 U
Anthracene	µg/kg	17000000	200 U	190 U	190 U	190 U	210 U
Anthracene (SIM)	µg/kg	3400000	3.9 U	3.7 U	5.4	3.7 U	2.1 J
Atrazine	µg/kg	210000	200 U	190 U	190 U	190 U	210 U
Benzaldehyde	µg/kg	6100000	200 U	190 U	190 U	190 U	210 U
Benzo(a)anthracene	µg/kg	600	180 U	170 U	160 U	170 U	190 U
Benzo(a)anthracene (SIM)	µg/kg	600	3.9 U	3.7 U	18 J	3.7 U	2.8 J
Benzo(a)pyrene	µg/kg	200	39 U	37 U	36 U	37 U	42 U
Benzo(a)pyrene (SIM)	µg/kg	200	3.9 U	3.7 U	25 J	3.7 U	4.2 U
Benzo(b)fluoranthene	µg/kg	600	180 U	170 U	160 U	170 U	190 U
Benzo(b)fluoranthene (SIM)	µg/kg	600	3.1 J	1.9 J	20	2.2 J	2.9 J
Benzo(g,h,i)perylene	µg/kg	380000000	200 U	190 U	190 U	190 U	210 U
Benzo(g,h,i)perylene (SIM)	µg/kg	380000000	3.9 U	3.7 U	13	3.7 U	4.2 U
Benzo(k)fluoranthene	µg/kg	6000	200 U	190 U	190 U	190 U	210 U
Benzo(k)fluoranthene (SIM)	µg/kg	6000	1.4 J	1.2 J	17	1.4 J	1.9 J
Bis(2-Chloroethoxy) methane	µg/kg	NL	200 U	190 U	190 U	190 U	210 U
Bis(2-Chloroethyl) ether	µg/kg	400	200 U	190 U	190 U	190 U	210 U
Bis(2-Ethylhexyl) phthalate	µg/kg	35000	200 U	190 U	190 U	650	210 U
Bis-Chloroisopropyl ether	µg/kg	23000	200 U	190 U	190 U	190 U	210 U
Butylbenzylphthalate	µg/kg	1200000	200 U	190 U	190 U	190 U	210 U
Caprolactam	µg/kg	31000000	200 U	190 U	190 U	190 U	210 U
Carbazole	µg/kg	24000	200 U	190 U	190 U	190 U	210 U
Chlorophenols	µg/kg	NL	200 U	190 U	190 U	190 U	210 U
Chrysene	µg/kg	62000	200 U	190 U	190 U	190 U	210 U
Chrysene (SIM)	µg/kg	62000	1.9 J	3.7 U	17 J	3.7 U	2.6 J
Dibenzo(a,h)anthracene	µg/kg	200	39 U	37 U	36 U	37 U	42 U
Dibenzo(a,h)anthracene (SIM)	µg/kg	200	3.9 U	3.7 U	6.7 J	3.7 U	4.2 U
Dibenzofuran	µg/kg	NL	200 U	190 U	23 J	190 U	210 U
Diethylphthalate	µg/kg	49000000	200 U	190 U	190 U	190 U	210 U
Dimethylphthalate	µg/kg	NL	200 U	190 U	190 U	190 U	210 U
Di-N-Butylphthalate	µg/kg	6100000	180 U	170 U	160 U	170 U	190 U
Di-N-Octyl Phthalate	µg/kg	2400000	200 U	190 U	190 U	190 U	210 U
Fluoranthene	µg/kg	2300000	200 U	190 U	36 J	190 U	210 U
Fluoranthene (SIM)	µg/kg	2300000	2.3 J	3.7 U	36	3.7 U	16
Fluorene	µg/kg	2300000	200 U	190 U	190 U	190 U	210 U
Fluorene (SIM)	µg/kg	2300000	3.9 U	3.7 U	21	3.7 U	3.9 J
Hexachlorobenzene	µg/kg	300	200 U	190 U	190 U	190 U	210 U
Hexachlorobutadiene	µg/kg	6000	47 U	45 U	44 U	44 U	51 U
Hexachlorocyclopentadiene	µg/kg	45000	200 U	190 U	190 U	190 U	210 U
Hexachloroethane	µg/kg	35000	200 U	190 U	190 U	190 U	210 U
Indeno(1,2,3-Cd)Pyrene	µg/kg	600	180 U	170 U	160 U	170 U	190 U
Indeno(1,2,3-Cd)Pyrene (SIM)	µg/kg	600	3.9 U	3.7 U	17	3.7 U	4.2 U
Isophorone	µg/kg	510000	200 U	190 U	190 U	190 U	210 U
Naphthalene	µg/kg	6000	200 U	190 U	190 U	190 U	210 U
Naphthalene (SIM)	µg/kg	6000	3.9 U	3.7 U	3.8	3.7 U	3 J
Nitrobenzene	µg/kg	31000	200 U	190 U	190 U	190 U	210 U
N-Nitroso-Di-N-Propylamine	µg/kg	200	81 U	78 U	75 U	76 U	87 U
N-Nitrosodiphenylamine	µg/kg	99000	200 U	190 U	190 U	190 U	210 U
Pentachlorophenol	µg/kg	3000	140 UJ	140 UJ	130 U	130 UJ	150 UJ
Pentachlorophenol (SIM)	µg/kg	3000	7.8 R	7.6 R	7.3 R	7.4 R	8.5 R
Phenanthrene	µg/kg	NL	200 U	190 U	26 J	190 U	210 U
Phenanthrene (SIM)	µg/kg	NL	3.9 U	3.7 U	28	3.7 U	3.3 J
Phenol	µg/kg	18000000	200 U	190 U	190 U	190 U	210 U
Pyrene	µg/kg	1700000	200 U	190 U	43 J	190 U	210 U
Pyrene (SIM)	µg/kg	1700000	3.8 J	3.7 U	39	3.7 U	15

NOTES  
SIM - SVOCs were analyzed by low level analysis and by SIM analysis to meet the project action criteria listed in the QAPP  
"T" in Location indicates Transect number  
CLP - Contract Laboratory Program  
Exceedances highlighted in blue.  
RBS-NJRDCSRS-Soil - NJDEP Residential Direct Contact Health Based Criteria and Soil Remediation Standards. Revised November 4, 2009.  
<http://www.state.nj.us/dep/srp/guidance/rs/>. Last accessed May 25, 2010

TABLE 5  
Test Excavation Data Summary  
Soil Sample Results – Semi-volatile Organic Compounds  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T1TP2-SS2	T1TP3-SS1	T1TP3-SS2	T25TP9-SS1	T25TP9-SS2
CLP Number			B7PW0	B7PW3	B7PW4	B7PS8	B7PS9
Location			T1-Test Pit2-Sample2	T1-Test Pit3-Sample1	T1-Test Pit3-Sample2	T1-Test Pit3-Sample2	T3-Test Pit1-Sample1
Area			Area-02	Area-02	Area-02	Area-02	Area-01
Date			4/22/2010	4/22/2010	4/22/2010	4/22/2010	4/26/2010
Start Depth			9.5	0	9.5	9.5	0
End Depth			10	2	10	10	2
Depth Units			ft	ft	ft	ft	ft
chemical_name	units	RBS-NJRDCSRS-Soil					
SEMIVOLATILE ORGANIC COMPOUNDS							
1,1'-Biphenyl	µg/kg	3100000	210 U	190 U	200 U	200 U	190 U
1,2,4,5-Tetrachlorobenzene	µg/kg	NL	210 U	190 U	200 U	200 U	190 U
2,4,5-Trichlorophenol	µg/kg	6100000	210 U	190 U	200 U	200 U	190 U
2,4,6-Trichlorophenol	µg/kg	19000	210 U	190 U	200 U	200 U	190 U
2,4-Dichlorophenol	µg/kg	180000	210 U	190 U	200 U	200 U	190 U
2,4-Dimethylphenol	µg/kg	1200000	40 U	37 U	39 U	40 U	37 U
2,4-Dinitrophenol	µg/kg	120000	74 U	68 U	72 U	73 U	68 U
2,4-Dinitrotoluene	µg/kg	700	40 U	37 U	39 U	40 U	37 U
2,6-Dinitrotoluene	µg/kg	700	210 U	190 U	200 U	200 U	190 U
2-Chloronaphthalene	µg/kg	NL	40 U	37 U	39 U	40 U	37 U
2-Chlorophenol	µg/kg	310000	210 U	190 U	200 U	200 U	190 U
2-Methylnaphthalene	µg/kg	230000	210 U	190 U	200 U	200 U	190 U
2-Methylnaphthalene (SIM)	µg/kg	230000	4 U	3.7 U	3.9 U	4 U	4.9
2-Methylphenol	µg/kg	310000	210 U	190 U	200 U	200 U	190 U
2-Nitroaniline	µg/kg	39000	400 U	370 U	390 U	400 U	370 U
2-Nitrophenol	µg/kg	NL	210 U	190 U	200 U	200 U	190 U
3,3'-Dichlorobenzidine	µg/kg	1000	210 U	190 U	200 U	200 U	190 U
3-Nitroaniline	µg/kg	NL	400 U	370 U	390 U	400 U	370 U
4,6-Dinitro-2-Methylphenol	µg/kg	6000	170 U	160 U	160 U	170 U	160 U
4-Bromophenyl Phenyl Ether	µg/kg	NL	210 U	190 U	200 U	200 U	190 U
4-Chloro-3-Methylphenol	µg/kg	NL	210 U	190 U	200 U	200 U	190 U
4-Chloroaniline	µg/kg	NL	210 U	190 U	200 U	200 U	190 U
4-Chlorophenyl Phenylether	µg/kg	NL	210 U	190 U	200 U	200 U	190 U
4-Methylphenol	µg/kg	31000	210 U	190 U	200 U	200 U	190 U
4-Nitroaniline	µg/kg	NL	400 U	370 U	390 U	400 U	370 U
4-Nitrophenol	µg/kg	NL	400 U	370 U	390 U	400 U	370 U
Acenaphthene	µg/kg	3400000	210 U	190 U	200 U	200 U	190 U
Acenaphthene (SIM)	µg/kg	NL	4 U	3.7 U	3.9 U	4 U	4.7
Acenaphthylene	µg/kg	NL	210 U	190 U	200 U	200 U	190 U
Acenaphthylene (SIM)	µg/kg	17000000	4 U	3.7 U	3.9 U	4 U	6.1
Acetophenone	µg/kg	2000	210 U	190 U	200 U	200 U	190 U
Anthracene	µg/kg	17000000	210 U	190 U	200 U	200 U	190 U
Anthracene (SIM)	µg/kg	3400000	4 U	3.7 U	3.9 U	4 U	7.5
Atrazine	µg/kg	210000	210 U	190 U	200 U	200 U	190 U
Benzaldehyde	µg/kg	6100000	210 U	190 U	200 U	200 U	190 U
Benzo(a)anthracene	µg/kg	600	180 U	170 U	180 U	180 U	35 J
Benzo(a)anthracene (SIM)	µg/kg	600	7.4	3.7 U	4.1	4.7	44
Benzo(a)pyrene	µg/kg	200	40 U	37 U	39 U	40 U	35 J
Benzo(a)pyrene (SIM)	µg/kg	200	9.1	3.7 U	8	6.7	55 J
Benzo(b)fluoranthene	µg/kg	600	180 U	170 U	180 U	180 U	36 J
Benzo(b)fluoranthene (SIM)	µg/kg	600	9.1	3.7 U	6.7	7.9	43
Benzo(g,h,i)perylene	µg/kg	380000000	210 U	190 U	200 U	200 U	33 J
Benzo(g,h,i)perylene (SIM)	µg/kg	380000000	5.3	3.7 U	6.3	7.3	35 J
Benzo(k)fluoranthene	µg/kg	6000	210 U	190 U	200 U	200 U	27 J
Benzo(k)fluoranthene (SIM)	µg/kg	6000	4.5	3.7 U	4.3	4.5	28 J
Bis(2-Chloroethoxy) methane	µg/kg	NL	210 U	190 U	200 U	200 U	190 U
Bis(2-Chloroethyl) ether	µg/kg	400	210 U	190 U	200 U	200 U	190 U
Bis(2-Ethylhexyl) phthalate	µg/kg	35000	210 U	610	200 U	200 U	190 U
Bis-Chloroisopropyl ether	µg/kg	23000	210 U	190 U	200 U	200 U	190 U
Butylbenzylphthalate	µg/kg	1200000	210 U	190 U	200 U	200 U	190 U
Caprolactam	µg/kg	31000000	210 U	190 U	200 U	200 U	190 U
Carbazole	µg/kg	24000	210 U	190 U	200 U	200 U	190 U
Chlorophenols	µg/kg	NL	210 U	190 U	200 U	200 U	190 U
Chrysene	µg/kg	62000	210 U	190 U	200 U	200 U	39 J
Chrysene (SIM)	µg/kg	62000	7	3.7 U	4.2	4.7	48
Dibenzo(a,h)anthracene	µg/kg	200	40 U	37 U	39 U	40 U	37 U
Dibenzo(a,h)anthracene (SIM)	µg/kg	200	4 U	3.7 U	4.1 J	5.4 J	12 J
Dibenzofuran	µg/kg	NL	210 U	190 U	200 U	200 U	190 U
Diethylphthalate	µg/kg	49000000	210 U	190 U	200 U	200 U	190 U
Dimethylphthalate	µg/kg	NL	210 U	190 U	200 U	200 U	190 U
Di-N-Butylphthalate	µg/kg	6100000	180 U	170 U	180 U	180 U	170 U
Di-N-Octyl Phthalate	µg/kg	2400000	210 U	190 U	200 U	200 U	190 U
Fluoranthene	µg/kg	2300000	210 U	190 U	200 U	200 U	70 J
Fluoranthene (SIM)	µg/kg	2300000	9.2	3.7 U	5.7	6.4	83
Fluorene	µg/kg	2300000	210 U	190 U	200 U	200 U	190 U
Fluorene (SIM)	µg/kg	2300000	4 U	3.7 U	3.9 U	4 U	8.9
Hexachlorobenzene	µg/kg	300	210 U	190 U	200 U	200 U	190 U
Hexachlorobutadiene	µg/kg	6000	49 U	44 U	47 U	48 U	45 U
Hexachlorocyclopentadiene	µg/kg	45000	210 U	190 U	200 U	200 U	190 U
Hexachloroethane	µg/kg	35000	210 U	190 U	200 U	200 U	190 U
Indeno(1,2,3-Cd)Pyrene	µg/kg	600	180 U	170 U	180 U	180 U	31 J
Indeno(1,2,3-Cd)Pyrene (SIM)	µg/kg	600	6.6	3.7 U	6.9	8.9	42
Isophorone	µg/kg	510000	210 U	190 U	200 U	200 U	190 U
Naphthalene	µg/kg	6000	210 U	190 U	200 U	200 U	190 U
Naphthalene (SIM)	µg/kg	6000	4 U	3.7 U	3.9 U	4 U	5.6
Nitrobenzene	µg/kg	31000	210 U	190 U	200 U	200 U	190 U
N-Nitroso-Di-N-Propylamine	µg/kg	200	84 U	77 U	81 U	83 U	77 U
N-Nitrosodiphenylamine	µg/kg	99000	210 U	190 U	200 U	200 U	190 U
Pentachlorophenol	µg/kg	3000	150 U	130 U	140 UJ	140 U	130 UJ
Pentachlorophenol (SIM)	µg/kg	3000	8.2 R	7.4 R	7.9 R	8 R	7.5 R
Phenanthrene	µg/kg	NL	210 U	190 U	200 U	200 U	57 J
Phenanthrene (SIM)	µg/kg	NL	3.1 J	3.7 U	3.4 J	3.4 J	71
Phenol	µg/kg	18000000	210 U	190 U	200 U	200 U	190 U
Pyrene	µg/kg	1700000	210 U	190 U	200 U	200 U	98 J
Pyrene (SIM)	µg/kg	1700000	11	3.7 U	8.6	8.1	100

NOTES  
SIM - SVOCs were analyzed by low level analysis and by SIM analysis to meet the project action criteria listed in the QAPP  
"T" in Location indicates Transect number  
CLP - Contract Laboratory Program  
Exceedances highlighted in blue.  
RBS-NJRDCSRS-Soil - NJDEP Residential Direct Contact Health Based Criteria and Soil Remediation Standards. Revised November 4, 2009.  
<http://www.state.nj.us/dep/srp/guidance/rs/>. Last accessed May 25, 2010

TABLE 5  
Test Excavation Data Summary  
Soil Sample Results – Semi-volatile Organic Compounds  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T25TP9-SS3	T25TP9-SS4	T25TP9-SS5	T25TP9-SS6	T2TP1-SS1
CLP Number			B7PT0	B7PT1	MB7PT2	MB7PT3	MB7PZ9
Location			T7-Test Pit1-Sample2	T10-Test Pit1-Sample1	T6-Test Pit2-Sample1	T11-Test Pit3-Sample1	T2-Test Pit1-Sample1
Area			Area-01	Area-01	Area-04	Area-04	Area-02
Date			4/28/2010	4/30/2010	5/3/2010	5/5/2010	4/21/2010
Start Depth			4	0	1	0	4
End Depth			5	2	2	2.5	4.5
Depth Units			ft	ft	ft	ft	ft
chemical_name	units	RBS-NJRDCSRS-Soil					
SEMIVOLATILE ORGANIC COMPOUNDS							
1,1'-Biphenyl	µg/kg	3100000	190 U	190 U	190 U	190 U	190 U
1,2,4,5-Tetrachlorobenzene	µg/kg	NL	190 U	190 U	190 U	190 U	190 U
2,4,5-Trichlorophenol	µg/kg	6100000	190 U	190 U	190 U	190 U	190 U
2,4,6-Trichlorophenol	µg/kg	19000	190 U	190 U	190 U	190 U	190 U
2,4-Dichlorophenol	µg/kg	180000	190 U	190 U	190 U	190 U	190 U
2,4-Dimethylphenol	µg/kg	1200000	36 U	36 U	38 U	37 U	36 U
2,4-Dinitrophenol	µg/kg	120000	67 U	67 U	70 U	68 U	67 U
2,4-Dinitrotoluene	µg/kg	700	36 U	36 U	38 U	37 U	36 U
2,6-Dinitrotoluene	µg/kg	700	190 U	190 U	190 U	190 U	190 U
2-Chloronaphthalene	µg/kg	NL	36 U	36 U	38 U	37 U	36 U
2-Chlorophenol	µg/kg	310000	190 U	190 U	190 U	190 U	190 U
2-Methylnaphthalene	µg/kg	230000	190 U	190 U	190 U	190 U	190 U
2-Methylnaphthalene (SIM)	µg/kg	230000	3.6 U	3.6 U	6.2	3.7 U	3.6 U
2-Methylphenol	µg/kg	310000	190 U	190 U	190 U	190 U	190 U
2-Nitroaniline	µg/kg	39000	360 U	360 U	380 U	370 U	360 U
2-Nitrophenol	µg/kg	NL	190 U	190 U	190 U	190 U	190 U
3,3'-Dichlorobenzidine	µg/kg	1000	190 U	190 U	190 U	190 U	190 U
3-Nitroaniline	µg/kg	NL	360 U	360 U	380 U	370 U	360 U
4,6-Dinitro-2-Methylphenol	µg/kg	6000	150 U	150 U	160 U	160 U	150 U
4-Bromophenyl Phenyl Ether	µg/kg	NL	190 U	190 U	190 U	190 U	190 U
4-Chloro-3-Methylphenol	µg/kg	NL	190 U	190 U	190 U	190 U	190 U
4-Chloroaniline	µg/kg	NL	190 U	190 U	190 U	190 U	190 U
4-Chlorophenyl Phenylether	µg/kg	NL	190 U	190 U	190 U	190 U	190 U
4-Methylphenol	µg/kg	31000	190 U	190 U	190 U	190 U	190 U
4-Nitroaniline	µg/kg	NL	360 U	360 U	380 U	370 U	360 U
4-Nitrophenol	µg/kg	NL	360 U	360 U	380 U	370 U	360 U
Acenaphthene	µg/kg	3400000	190 U	190 U	190 U	190 U	190 U
Acenaphthene (SIM)	µg/kg	NL	3.6 U	3.6 U	2.7 J	3.7 U	3.6 U
Acenaphthylene	µg/kg	NL	190 U	190 U	190 U	190 U	190 U
Acenaphthylene (SIM)	µg/kg	17000000	3.6 U	3.6 U	4.5	3.7 U	3.6 U
Acetophenone	µg/kg	2000	190 U	190 U	190 U	190 U	190 U
Anthracene	µg/kg	17000000	190 U	190 U	190 U	190 U	190 U
Anthracene (SIM)	µg/kg	3400000	3.6 U	3.6 U	4.5	3.7 U	3.6 U
Atrazine	µg/kg	210000	190 U	190 U	190 U	190 U	190 U
Benzaldehyde	µg/kg	6100000	190 U	190 U	190 U	190 U	190 U
Benzo(a)anthracene	µg/kg	600	160 U	170 U	19 J	170 U	160 U
Benzo(a)anthracene (SIM)	µg/kg	600	2.7 J	3.1 J	46 J	2.1 J	2.6 J
Benzo(a)pyrene	µg/kg	200	36 U	36 U	21 J	37 U	36 U
Benzo(a)pyrene (SIM)	µg/kg	200	3.6 U	7	52 J	3.8 U	3.6 U
Benzo(b)fluoranthene	µg/kg	600	160 U	170 U	170 U	170 U	160 U
Benzo(b)fluoranthene (SIM)	µg/kg	600	4.1	6.7	43	6.5	3.6 J
Benzo(g,h,i)perylene	µg/kg	380000000	190 U	190 U	190 U	190 U	190 U
Benzo(g,h,i)perylene (SIM)	µg/kg	380000000	4.5	6.6	29 J	5.4	3.6 U
Benzo(k)fluoranthene	µg/kg	6000	190 U	190 U	190 U	190 U	190 U
Benzo(k)fluoranthene (SIM)	µg/kg	6000	2.5 J	3.5 J	33 J	2.9 J	2.1 J
Bis(2-Chloroethoxy) methane	µg/kg	NL	190 U	190 U	190 U	190 U	190 U
Bis(2-Chloroethyl) ether	µg/kg	400	190 U	190 U	190 U	190 U	190 U
Bis(2-Ethylhexyl) phthalate	µg/kg	35000	190 U	190 U	190 U	190 U	190 U
Bis-Chloroisopropyl ether	µg/kg	23000	190 U	190 U	190 U	190 U	190 U
Butylbenzylphthalate	µg/kg	1200000	190 U	190 U	190 U	190 U	190 U
Caprolactam	µg/kg	31000000	190 U	190 U	190 U	190 U	190 U
Carbazole	µg/kg	24000	190 U	190 U	190 U	190 U	190 U
Chlorophenols	µg/kg	NL	190 U	190 U	190 U	190 U	190 U
Chrysene	µg/kg	62000	190 U	190 U	22 J	190 U	190 U
Chrysene (SIM)	µg/kg	62000	2.9 J	3.7	46 J	2.5 J	2.5 J
Dibenzo(a,h)anthracene	µg/kg	200	36 U	36 U	38 U	37 U	36 U
Dibenzo(a,h)anthracene (SIM)	µg/kg	200	3.6 U	3.9 J	12 J	3.7 U,J	3.6 U
Dibenzofuran	µg/kg	NL	190 U	190 U	190 U	190 U	190 U
Diethylphthalate	µg/kg	49000000	190 U	190 U	190 U	190 U	190 U
Dimethylphthalate	µg/kg	NL	190 U	190 U	190 U	190 U	190 U
Di-N-Butylphthalate	µg/kg	6100000	160 U	170 U	170 U	170 U	160 U
Di-N-Octyl Phthalate	µg/kg	2400000	190 U	190 U	190 U	190 U	190 U
Fluoranthene	µg/kg	2300000	190 U	190 U	32 J	190 U	190 U
Fluoranthene (SIM)	µg/kg	2300000	3.2 J	4.3	51	3.4 J	2.1 J
Fluorene	µg/kg	2300000	190 U	190 U	190 U	190 U	190 U
Fluorene (SIM)	µg/kg	2300000	3.6 U	3.6 U	3.5 J	3.7 U	3.6 U
Hexachlorobenzene	µg/kg	300	190 U	190 U	190 U	190 U	190 U
Hexachlorobutadiene	µg/kg	6000	44 U	44 U	46 U	45 U	44 U
Hexachlorocyclopentadiene	µg/kg	45000	190 U	190 U	190 U	190 U	190 U
Hexachloroethane	µg/kg	35000	190 U	190 U	190 U	190 U	190 U
Indeno(1,2,3-Cd)Pyrene	µg/kg	600	160 U	170 U	170 U	170 U	160 U
Indeno(1,2,3-Cd)Pyrene (SIM)	µg/kg	600	5.6 J	7.2 J	38 J	6.8	4.1
Isophorone	µg/kg	510000	190 U	190 U	190 U	190 U	190 U
Naphthalene	µg/kg	6000	190 U	190 U	190 U	190 U	190 U
Naphthalene (SIM)	µg/kg	6000	3.6 U	2 J	4.1 U	3.7 U	3.6 U
Nitrobenzene	µg/kg	31000	190 U	190 U	190 U	190 U	190 U
N-Nitroso-Di-N-Propylamine	µg/kg	200	75 U	76 U	79 U	77 U	76 U
N-Nitrosodiphenylamine	µg/kg	99000	190 U	190 U	190 U	190 U	190 U
Pentachlorophenol	µg/kg	3000	130 U	130 U	140 U	130 U	130 U
Pentachlorophenol (SIM)	µg/kg	3000	7.3 R	7.4 R	7.7 R	7.5 R	7.4 R
Phenanthrene	µg/kg	NL	190 U	190 U	190 U	190 U	190 U
Phenanthrene (SIM)	µg/kg	NL	2 J	2.3 J	28 J	2.6 J	3.6 U
Phenol	µg/kg	18000000	190 U	190 U	190 U	190 U	190 U
Pyrene	µg/kg	1700000	190 U	190 U	49 J	190 U	190 U
Pyrene (SIM)	µg/kg	1700000	5.6	7.8	65	5.5	4.4

NOTES  
SIM - SVOCs were analyzed by low level analysis and by SIM analysis to meet the project action criteria listed in the QAPP  
"T" In Location indicates Transect number  
CLP - Contract Laboratory Program  
Exceedances highlighted in blue.  
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<http://www.state.nj.us/dep/erp/guidance/rsi/>. Last accessed May 25, 2010

TABLE 5  
Test Excavation Data Summary  
Soil Sample Results – Semi-volatile Organic Compounds  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T2TP2-SS2	T2TP2-SS3	T2TP2-SS4	T3TP1-SS1	T3TP1-SS2
CLP Number		B7Q04	B7Q05	B7Q06	B7Q07	B7Q08	
Location		T2-Test Pit2-Sample2	T2-Test Pit2-Sample3	T2-Test Pit2-Sample4	T3-Test Pit1-Sample1	T3-Test Pit1-Sample2	
Area		Area-02	Area-02	Area-02	Area-01	Area-01	
Date		4/21/2010	4/21/2010	4/22/2010	4/26/2010	4/26/2010	
Start Depth		7.5	6.5	0	0	4	
End Depth		8	7	1	2	4.5	
Depth Units		ft	ft	ft	ft	ft	
chemical_name	units	RBS-NJRDCSRS-Soil					
SEMIVOLATILE ORGANIC COMPOUNDS							
1,1'-Biphenyl	µg/kg	3100000	190 U	200 U	180 U	190 U	190 U
1,2,4,5-Tetrachlorobenzene	µg/kg	NL	190 U	200 U	180 U	190 U	190 U
2,4,5-Trichlorophenol	µg/kg	6100000	190 U	200 U	180 U	190 U	190 U
2,4,6-Trichlorophenol	µg/kg	19000	190 U	200 U	180 U	190 U	190 U
2,4-Dichlorophenol	µg/kg	180000	190 U	200 U	180 U	190 U	190 U
2,4-Dimethylphenol	µg/kg	1200000	38 U	40 U	35 U	37 U	37 U
2,4-Dinitrophenol	µg/kg	120000	70 U	74 U	64 U	68 U	68 U
2,4-Dinitrotoluene	µg/kg	700	38 U	40 U	35 U	37 U	37 U
2,6-Dinitrotoluene	µg/kg	700	190 U	200 U	180 U	190 U	190 U
2-Chloronaphthalene	µg/kg	NL	38 U	40 U	35 U	37 U	37 U
2-Chlorophenol	µg/kg	310000	190 U	200 U	180 U	190 U	190 U
2-Methylnaphthalene	µg/kg	230000	190 U	200 U	180 U	190 U	190 U
2-Methylnaphthalene (SIM)	µg/kg	230000	3.8 U	4 U	3.5 U	2.7 J	3.7 U
2-Methylphenol	µg/kg	310000	190 U	200 U	180 U	190 U	190 U
2-Nitroaniline	µg/kg	39000	380 U	400 U	350 U	370 U	370 U
2-Nitrophenol	µg/kg	NL	190 U	200 U	180 U	190 U	190 U
3,3'-Dichlorobenzidine	µg/kg	1000	190 U	200 U	180 U	190 U	190 U
3-Nitroaniline	µg/kg	NL	380 U	400 U	350 U	370 U	370 U
4,6-Dinitro-2-Methylphenol	µg/kg	6000	160 U	170 U	150 U	160 U	160 U
4-Bromophenyl Phenyl Ether	µg/kg	NL	190 U	200 U	180 U	190 U	190 U
4-Chloro-3-Methylphenol	µg/kg	NL	190 U	200 U	180 U	190 U	190 U
4-Chloroaniline	µg/kg	NL	190 U	200 U	180 U	190 U	190 U
4-Chlorophenyl Phenylether	µg/kg	NL	190 U	200 U	180 U	190 U	190 U
4-Methylphenol	µg/kg	31000	190 U	200 U	180 U	190 U	190 U
4-Nitroaniline	µg/kg	NL	380 U	400 U	350 U	370 U	370 U
4-Nitrophenol	µg/kg	NL	380 U	400 U	350 U	370 U	370 U
Acenaphthene	µg/kg	3400000	190 U	200 U	180 U	190 U	190 U
Acenaphthene (SIM)	µg/kg	NL	3.8 U	4 U	3.5 U	3.7 U	3.7 U
Acenaphthylene	µg/kg	NL	190 U	200 U	180 U	190 U	190 U
Acenaphthylene (SIM)	µg/kg	17000000	3.8 U	4 U	5.6	2.2 J	3.7 U
Acetophenone	µg/kg	2000	190 U	200 U	180 U	190 U	190 U
Anthracene	µg/kg	17000000	190 U	200 U	180 U	190 U	190 U
Anthracene (SIM)	µg/kg	3400000	3.8 U	4 U	2 J	2.6 J	3.7 U
Atrazine	µg/kg	210000	190 U	200 U	180 U	190 U	190 U
Benzaldehyde	µg/kg	6100000	190 U	200 U	180 U	190 U	190 U
Benzo(a)anthracene	µg/kg	600	170 U	180 U	15 J	170 U	170 U
Benzo(a)anthracene (SIM)	µg/kg	600	2.4 J	4 U	22	20	4.3
Benzo(a)pyrene	µg/kg	200	38 U	40 U	18 J	37 U	37 U
Benzo(a)pyrene (SIM)	µg/kg	200	3.8 U	4 U	20	19	7.1
Benzo(b)fluoranthene	µg/kg	600	170 U	180 U	18 J	170 U	170 U
Benzo(b)fluoranthene (SIM)	µg/kg	600	3.4 J	2.7 J	22	23	8.7
Benzo(g,h,i)perylene	µg/kg	380000000	190 U	200 U	180 U	190 U	190 U
Benzo(g,h,i)perylene (SIM)	µg/kg	380000000	3.8 U	4 U	14	19	6.6
Benzo(k)fluoranthene	µg/kg	6000	190 U	200 U	180 U	190 U	190 U
Benzo(k)fluoranthene (SIM)	µg/kg	6000	2.2 J	1.8 J	16	13 J	5.2
Bis(2-Chloroethoxy) methane	µg/kg	NL	190 U	200 U	180 U	190 U	190 U
Bis(2-Chloroethyl) ether	µg/kg	400	190 U	200 U	180 U	190 U	190 U
Bis(2-Ethylhexyl) phthalate	µg/kg	35000	190 U	200 U	180 U	190 U	190 U
Bis-Chloroisopropyl ether	µg/kg	23000	190 U	200 U	180 U	190 U	190 U
Butylbenzylphthalate	µg/kg	1200000	190 U	200 U	180 U	190 U	190 U
Caprolactam	µg/kg	31000000	190 U	200 U	180 U	190 U	190 U
Carbazole	µg/kg	24000	190 U	200 U	180 U	190 U	190 U
Chlorophenols	µg/kg	NL	190 U	200 U	180 U	190 U	190 U
Chrysene	µg/kg	62000	190 U	200 U	19 J	190 U	190 U
Chrysene (SIM)	µg/kg	62000	3.2 J	4 U	25	22	5.7
Dibenzo(a,h)anthracene	µg/kg	200	38 U	40 U	35 U	37 U	37 U
Dibenzo(a,h)anthracene (SIM)	µg/kg	200	3.8 U	4 U	5.6 J	8.9 J	3 U
Dibenzofuran	µg/kg	NL	190 U	200 U	180 U	190 U	190 U
Diethylphthalate	µg/kg	49000000	190 U	200 U	180 U	190 U	190 U
Dimethylphthalate	µg/kg	NL	190 U	200 U	180 U	190 U	190 U
Di-N-Butylphthalate	µg/kg	6100000	170 U	180 U	160 U	170 U	170 U
Di-N-Octyl Phthalate	µg/kg	2400000	190 U	200 U	180 U	190 U	190 U
Fluoranthene	µg/kg	2300000	190 U	200 U	22 J	22 J	190 U
Fluoranthene (SIM)	µg/kg	2300000	3.3 J	4 U	31	32	5.8
Fluorene	µg/kg	2300000	190 U	200 U	180 U	190 U	190 U
Fluorene (SIM)	µg/kg	2300000	3.8 U	4 U	3.5 U	3.7 U	3.7 U
Hexachlorobenzene	µg/kg	300	190 U	200 U	180 U	190 U	190 U
Hexachlorobutadiene	µg/kg	6000	46 U	48 U	42 U	45 U	44 U
Hexachlorocyclopentadiene	µg/kg	45000	190 U	200 U	180 U	190 U	190 U
Hexachloroethane	µg/kg	35000	190 U	200 U	180 U	190 U	190 U
Indeno(1,2,3-Cd)Pyrene	µg/kg	600	170 U	180 U	160 U	170 U	170 U
Indeno(1,2,3-Cd)Pyrene (SIM)	µg/kg	600	4.1	4.1	17	25	7.7
Isophorone	µg/kg	510000	190 U	200 U	180 U	190 U	190 U
Naphthalene	µg/kg	6000	190 U	200 U	180 U	190 U	190 U
Naphthalene (SIM)	µg/kg	6000	3.8 U	4 U	1.7 J	3.4 J	1.9 J
Nitrobenzene	µg/kg	31000	190 U	200 U	180 U	190 U	190 U
N-Nitroso-Di-N-Propylamine	µg/kg	200	79 U	83 U	73 U	77 U	76 U
N-Nitrosodiphenylamine	µg/kg	99000	190 U	200 U	180 U	190 U	190 U
Pentachlorophenol	µg/kg	3000	140 UJ	140 UJ	130 UJ	130 U	130 UJ
Pentachlorophenol (SIM)	µg/kg	3000	7.7 R	8.1 R	7.1 R	7.5 R	7.4 R
Phenanthrene	µg/kg	NL	190 U	200 U	180 U	190 U	190 U
Phenanthrene (SIM)	µg/kg	NL	3.9	4 U	17	15	3.1 J
Phenol	µg/kg	18000000	190 U	200 U	180 U	190 U	190 U
Pyrene	µg/kg	1700000	190 U	200 U	39 J	31 J	190 U
Pyrene (SIM)	µg/kg	1700000	7.4	3.4 J	49	38	9.2

NOTES  
SIM - SVOCs were analyzed by low level analysis and by SIM analysis to meet the project action criteria listed in the QAPP  
"T" in Location indicates Transect number  
CLP - Contract Laboratory Program  
Exceedances highlighted in blue.  
RBS-NJRDCSRS-Soil - NJDEP Residential Direct Contact Health Based Criteria and Soil Remediation Standards. Revised November 4, 2009.  
<http://www.state.nj.us/dep/srp/guidance/rsr/>. Last accessed May 25, 2010

TABLE 5  
Test Excavation Data Summary  
Soil Sample Results – Semi-volatile Organic Compounds  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T3TP1-SS3	T4TP1-SS1	T4TP1-SS2	T4TP2-SS1	T4TP2-SS2
CLP Number			B7Q09	B7Q15	B7Q16	MB7Q19	MB7Q20
Location			T3-Test Pit1-Sample3	T4-Test Pit1-Sample1	T4-Test Pit1-Sample2	T4-Test Pit2-Sample1	T4-Test Pit2-Sample2
Area			Area-01	Area-01	Area-01	Area-04	Area-04
Date			4/26/2010	4/26/2010	4/26/2010	5/3/2010	5/3/2010
Start Depth			7.5	0	8	0	5
End Depth			8	2	8.5	2	6
Depth Units			ft	ft	ft	ft	ft
chemical_name	units	RBS-NJRDCSRS-Soil					
SEMIVOLATILE ORGANIC COMPOUNDS							
1,1'-Biphenyl	µg/kg	3100000	200 U	190 U	190 U	180 U	210 U
1,2,4,5-Tetrachlorobenzene	µg/kg	NL	200 U	190 U	190 U	180 U	210 U
2,4,5-Trichlorophenol	µg/kg	6100000	200 U	190 U	190 U	180 U	210 U
2,4,6-Trichlorophenol	µg/kg	19000	200 U	190 U	190 U	180 U	210 U
2,4-Dichlorophenol	µg/kg	180000	200 U	190 U	190 U	180 U	210 U
2,4-Dimethylphenol	µg/kg	1200000	38 U	38 U	38 U	36 U	41 U
2,4-Dinitrophenol	µg/kg	120000	71 U	70 U	69 U	66 U	75 U
2,4-Dinitrotoluene	µg/kg	700	38 U	38 U	38 U	36 U	41 U
2,6-Dinitrotoluene	µg/kg	700	200 U	190 U	190 U	180 U	210 U
2-Chloronaphthalene	µg/kg	NL	38 U	38 U	38 U	36 U	41 U
2-Chlorophenol	µg/kg	310000	200 U	190 U	190 U	180 U	210 U
2-Methylnaphthalene	µg/kg	230000	200 U	190 U	190 U	180 U	210 U
2-Methylnaphthalene (SIM)	µg/kg	230000	3.8 U	3.8 U	3.8 U	3.6 U	4.1 U
2-Methylphenol	µg/kg	310000	200 U	190 U	190 U	180 U	210 U
2-Nitroaniline	µg/kg	39000	380 U	380 U	380 U	360 U	410 U
2-Nitrophenol	µg/kg	NL	200 U	190 U	190 U	180 U	210 U
3,3'-Dichlorobenzidine	µg/kg	1000	200 U	190 U	190 U	180 U	210 U
3-Nitroaniline	µg/kg	NL	380 U	380 U	380 U	360 U	410 U
4,6-Dinitro-2-Methylphenol	µg/kg	6000	160 U	160 U	160 U	150 U	170 U
4-Bromophenyl Phenyl Ether	µg/kg	NL	200 U	190 U	190 U	180 U	210 U
4-Chloro-3-Methylphenol	µg/kg	NL	200 U	190 U	190 U	180 U	210 U
4-Chloroaniline	µg/kg	NL	200 U	190 U	190 U	180 U	210 U
4-Chlorophenyl Phenylether	µg/kg	NL	200 U	190 U	190 U	180 U	210 U
4-Methylphenol	µg/kg	31000	200 U	190 U	190 U	180 U	210 U
4-Nitroaniline	µg/kg	NL	380 U	380 U	380 U	360 U	410 U
4-Nitrophenol	µg/kg	NL	380 U	380 U	380 U	360 U	410 U
Acenaphthene	µg/kg	3400000	200 U	190 U	190 U	180 U	210 U
Acenaphthene (SIM)	µg/kg	NL	3.8 U	3.8 U	3.8 U	3.6 U	4.1 U
Acenaphthylene	µg/kg	NL	200 U	190 U	190 U	180 U	210 U
Acenaphthylene (SIM)	µg/kg	17000000	3.8 U	3.8 U	3.8 U	3.6 U	4.1 U
Acetophenone	µg/kg	2000	200 U	190 U	190 U	180 U	210 U
Anthracene	µg/kg	17000000	200 U	190 U	190 U	180 U	210 U
Anthracene (SIM)	µg/kg	3400000	3.8 U	3.8 U	3.8 U	3.6 U	4.1 U
Atrazine	µg/kg	210000	200 U	190 U	190 U	180 U	210 U
Benzaldehyde	µg/kg	6100000	200 U	190 U	190 U	180 U	210 U
Benzo(a)anthracene	µg/kg	600	170 U	170 U	170 U	160 U	180 U
Benzo(a)anthracene (SIM)	µg/kg	600	3.8 U	17	3.3 J	3.6 U	4.1 U
Benzo(a)pyrene	µg/kg	200	38 U	38 U	38 U	36 U	41 U
Benzo(a)pyrene (SIM)	µg/kg	200	3.8 U	19	6.9	3.6 U	4.1 U
Benzo(b)fluoranthene	µg/kg	600	170 U	170 U	170 U	160 U	180 U
Benzo(b)fluoranthene (SIM)	µg/kg	600	3.8 U	24 J	6.4	3.6 U	4.1 U
Benzo(g,h,i)perylene	µg/kg	380000000	200 U	190 U	190 U	180 U	210 U
Benzo(g,h,i)perylene (SIM)	µg/kg	380000000	3.8 U	12	5.7	3.6 U	4.1 U
Benzo(k)fluoranthene	µg/kg	6000	200 U	190 U	190 U	180 U	210 U
Benzo(k)fluoranthene (SIM)	µg/kg	6000	3.8 U	12	4.1	3.6 U	4.1 U
Bis(2-Chloroethoxy) methane	µg/kg	NL	200 U	190 U	190 U	180 U	210 U
Bis(2-Chloroethyl) ether	µg/kg	400	200 U	190 U	190 U	180 U	210 U
Bis(2-Ethylhexyl) phthalate	µg/kg	35000	200 U	190 U	190 U	180 U	210 U
Bis-Chloroisopropyl ether	µg/kg	23000	200 U	190 U	190 U	180 U	210 U
Butylbenzylphthalate	µg/kg	1200000	200 U	190 U	190 U	180 U	210 U
Caprolactam	µg/kg	31000000	200 U	190 U	190 U	180 U	210 U
Carbazole	µg/kg	24000	200 U	190 U	190 U	180 U	210 U
Chlorophenols	µg/kg	NL	200 U	190 U	190 U	180 U	210 U
Chrysene	µg/kg	62000	200 U	190 U	190 U	180 U	210 U
Chrysene (SIM)	µg/kg	62000	3.8 U	17	3.9	3.6 U	4.1 U
Dibenzo(a,h)anthracene	µg/kg	200	38 U	38 U	38 U	36 U	41 U
Dibenzo(a,h)anthracene (SIM)	µg/kg	200	3.8 U	5.4 J	3.8 U	3.6 UJ	4.1 UJ
Dibenzofuran	µg/kg	NL	200 U	190 U	190 U	180 U	210 U
Diethylphthalate	µg/kg	49000000	200 U	190 U	190 U	180 U	210 U
Dimethylphthalate	µg/kg	NL	200 U	190 U	190 U	180 U	210 U
Di-N-Butylphthalate	µg/kg	6100000	170 U	170 U	170 U	160 U	180 U
Di-N-Octyl Phthalate	µg/kg	2400000	200 U	190 U	190 U	180 U	210 U
Fluoranthene	µg/kg	2300000	200 U	190 U	190 U	180 U	210 U
Fluoranthene (SIM)	µg/kg	2300000	3.8 U	23 J	4.1	3.6 U	4.1 U
Fluorene	µg/kg	2300000	200 U	190 U	190 U	180 U	210 U
Fluorene (SIM)	µg/kg	2300000	3.8 U	3.8 U	3.8 U	3.6 U	4.1 U
Hexachlorobenzene	µg/kg	300	200 U	190 U	190 U	180 U	210 U
Hexachlorobutadiene	µg/kg	6000	47 U	46 U	45 U	43 U	49 U
Hexachlorocyclopentadiene	µg/kg	45000	200 U	190 U	190 U	180 U	210 U
Hexachloroethane	µg/kg	35000	200 U	190 U	190 U	180 U	210 U
Indeno(1,2,3-Cd)Pyrene	µg/kg	600	170 U	170 U	170 U	160 U	180 U
Indeno(1,2,3-Cd)Pyrene (SIM)	µg/kg	600	3.8 U	15	6.9	3.7 U	4.1 U
Isophorone	µg/kg	510000	200 U	190 U	190 U	180 U	210 U
Naphthalene	µg/kg	6000	200 U	190 U	190 U	180 U	210 U
Naphthalene (SIM)	µg/kg	6000	3.8 U	3.8 U	3.8 U	3.6 U	4.1 U
Nitrobenzene	µg/kg	31000	200 U	190 U	190 U	180 U	210 U
N-Nitroso-Di-N-Propylamine	µg/kg	200	80 U	79 U	78 U	75 U	85 U
N-Nitrosodiphenylamine	µg/kg	99000	200 U	190 U	190 U	180 U	210 U
Pentachlorophenol	µg/kg	3000	140 UJ	140 U	140 UJ	130 U	150 U
Pentachlorophenol (SIM)	µg/kg	3000	7.8 R	7.7 R	7.6 R	7.3 R	8.2 R
Phenanthrene	µg/kg	NL	200 U	190 U	190 U	180 U	210 U
Phenanthrene (SIM)	µg/kg	NL	3.8 U	10	3.8 U	3.6 U	4.1 U
Phenol	µg/kg	18000000	200 U	190 U	190 U	180 U	210 U
Pyrene	µg/kg	1700000	200 U	21 J	190 U	180 U	210 U
Pyrene (SIM)	µg/kg	1700000	3.8 U	33 J	6.7	3.6 U	4.1 U

NOTES  
SIM - SVOCs were analyzed by low level analysis and by SIM analysis to meet the project action criteria listed in the QAPP  
"T" In Location Indicates Transect number  
CLP - Contract Laboratory Program  
Exceedances highlighted in blue.  
RBS-NJRDCSRS-Soil - NJDEP Residential Direct Contact Health Based Criteria and Soil Remediation Standards. Revised November 4, 2009.  
<http://www.state.nj.us/dep/srp/guidance/rs/>. Last accessed May 26, 2010

TABLE 5  
Test Excavation Data Summary  
Soil Sample Results – Semi-volatile Organic Compounds  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T5TP1-SS1	T5TP1-SS2	T6TP1-SS1	T6TP1-SS2	T6TP2-SS1
CLP Number			B7Q23	B7Q24	B7Q31	B7Q32	MB7Q35
Location			T5-Test Pit1-Sample1	T5-Test Pit1-Sample2	T6-Test Pit1-Sample1	T6-Test Pit1-Sample2	T6-Test Pit2-Sample1
Area			Area-01	Area-01	Area-01	Area-01	Area-04
Date			4/29/2010	4/29/2010	4/27/2010	4/27/2010	5/3/2010
Start Depth			0	6		4	1
End Depth			2	7		4.5	2
Depth Units			ft	ft		ft	ft
chemical_name	units	RBS-NJRDCSRS-Soil					
SEMIVOLATILE ORGANIC COMPOUNDS							
1,1'-Biphenyl	µg/kg	3100000	190 U	210 U	200 U	190 U	190 U
1,2,4,5-Tetrachlorobenzene	µg/kg	NL	190 U	210 U	200 U	190 U	190 U
2,4,5-Trichlorophenol	µg/kg	6100000	190 U	210 U	200 U	190 U	190 U
2,4,6-Trichlorophenol	µg/kg	19000	190 U	210 U	200 U	190 U	190 U
2,4-Dichlorophenol	µg/kg	180000	190 U	210 U	200 U	190 U	190 U
2,4-Dimethylphenol	µg/kg	1200000	37 U	41 U	39 U	37 U	37 U
2,4-Dinitrophenol	µg/kg	120000	68 U	75 U	71 U	68 U	69 U
2,4-Dinitrotoluene	µg/kg	700	37 U	41 U	39 U	37 U	37 U
2,6-Dinitrotoluene	µg/kg	700	190 U	210 U	200 U	190 U	190 U
2-Chloronaphthalene	µg/kg	NL	37 U	41 U	39 U	37 U	37 U
2-Chlorophenol	µg/kg	310000	190 U	210 U	200 U	190 U	190 U
2-Methylnaphthalene	µg/kg	230000	190 U	210 U	200 U	190 U	190 U
2-Methylnaphthalene (SIM)	µg/kg	230000	27 J	4.1 U	3 J	1.4 J	3.1 J
2-Methylphenol	µg/kg	310000	190 U	210 U	200 U	190 U	190 U
2-Nitroaniline	µg/kg	39000	370 U	410 U	390 U	370 U	370 U
2-Nitrophenol	µg/kg	NL	190 U	210 U	200 U	190 U	190 U
3,3'-Dichlorobenzidine	µg/kg	1000	190 U	210 U	200 U	190 U	190 U
3-Nitroaniline	µg/kg	NL	370 U	410 U	390 U	370 U	370 U
4,6-Dinitro-2-Methylphenol	µg/kg	6000	160 U	170 U	160 U	160 U	160 U
4-Bromophenyl Phenyl Ether	µg/kg	NL	190 U	210 U	200 U	190 U	190 U
4-Chloro-3-Methylphenol	µg/kg	NL	190 U	210 U	200 U	190 U	190 U
4-Chloroaniline	µg/kg	NL	190 U	210 U	200 U	190 U	190 U
4-Chlorophenyl Phenylether	µg/kg	190 U	190 U	210 U	200 U	190 U	190 U
4-Methylphenol	µg/kg	31000	190 U	210 U	200 U	190 U	190 U
4-Nitroaniline	µg/kg	NL	370 U	410 U	390 U	370 U	370 U
4-Nitrophenol	µg/kg	NL	370 U	410 U	390 U	370 U	370 U
Acenaphthene	µg/kg	3400000	190 U	210 U	200 U	190 U	190 U
Acenaphthene (SIM)	µg/kg	NL	7.3	4.1 U	3.9 U	1.9 J	3.7 U
Acenaphthylene	µg/kg	NL	190 U	210 U	200 U	190 U	190 U
Acenaphthylene (SIM)	µg/kg	17000000	8.1	4.1 U	3.9 U	3.7 U	4.1
Acetophenone	µg/kg	2000	190 U	210 U	200 U	190 U	190 U
Anthracene	µg/kg	17000000	18 J	210 U	200 U	190 U	190 U
Anthracene (SIM)	µg/kg	3400000	30 J	4.1 U	3.9 U	5	3.2 J
Atrazine	µg/kg	210000	190 U	210 U	200 U	190 U	190 U
Benzaldehyde	µg/kg	6100000	190 U	210 U	200 U	190 U	190 U
Benzo(a)anthracene	µg/kg	600	66 J	180 U	180 U	42 J	170 U
Benzo(a)anthracene (SIM)	µg/kg	600	150 J	4.1 U	14	48	38 J
Benzo(a)pyrene	µg/kg	200	62 J	41 U	39 U	40 J	19 J
Benzo(a)pyrene (SIM)	µg/kg	200	99 J	4.1 U	17	38	43 J
Benzo(b)fluoranthene	µg/kg	600	59 J	180 U	180 U	33 J	170 U
Benzo(b)fluoranthene (SIM)	µg/kg	600	230	4.1 U	15 J	51	51 J
Benzo(g,h,i)perylene	µg/kg	380000000	47 J	210 U	200 U	32 J	190 U
Benzo(g,h,i)perylene (SIM)	µg/kg	380000000	340	4.1 U	11	18	26 J
Benzo(k)fluoranthene	µg/kg	6000	52 J	210 U	200 U	37 J	190 U
Benzo(k)fluoranthene (SIM)	µg/kg	6000	110 J	4.1 U	11	28 J	28 J
Bis(2-Chloroethoxy) methane	µg/kg	NL	190 U	210 U	200 U	190 U	190 U
Bis(2-Chloroethyl) ether	µg/kg	400	190 U	210 U	200 U	190 U	190 U
Bis(2-Ethylhexyl) phthalate	µg/kg	35000	190 U	210 U	200 U	190 U	190 U
Bis-Chloroisopropyl ether	µg/kg	23000	190 U	210 U	200 U	190 U	190 U
Butylbenzylphthalate	µg/kg	1200000	190 U	210 U	200 U	190 U	190 U
Caprolactam	µg/kg	31000000	190 U	210 U	200 U	190 U	190 U
Carbazole	µg/kg	24000	190 U	210 U	200 U	190 U	190 U
Chlorophenols	µg/kg	NL	190 U	210 U	200 U	190 U	190 U
Chrysene	µg/kg	62000	65 J	210 U	200 U	41 J	190 U
Chrysene (SIM)	µg/kg	62000	130 J	4.1 U	17	44	39 J
Dibenzo(a,h)anthracene	µg/kg	200	37 U	41 U	39 U	37 U	37 U
Dibenzo(a,h)anthracene (SIM)	µg/kg	200	360 J	4.1 U	5.2 J	7.8 J	11 J
Dibenzofuran	µg/kg	NL	190 U	210 U	200 U	190 U	190 U
Diethylphthalate	µg/kg	49000000	190 U	210 U	200 U	190 U	190 U
Dimethylphthalate	µg/kg	NL	190 U	210 U	200 U	190 U	190 U
Di-N-Butylphthalate	µg/kg	6100000	170 U	180 U	180 U	170 U	170 U
Di-N-Octyl Phthalate	µg/kg	2400000	190 U	210 U	200 U	190 U	190 U
Fluoranthene	µg/kg	2300000	120 J	210 U	200 U	59 J	27 J
Fluoranthene (SIM)	µg/kg	2300000	250	4.1 U	17	72	43
Fluorene	µg/kg	2300000	190 U	210 U	200 U	190 U	190 U
Fluorene (SIM)	µg/kg	2300000	15	4.1 U	3.9 U	3.7 U	1.9 J
Hexachlorobenzene	µg/kg	300	190 U	210 U	200 U	190 U	190 U
Hexachlorobutadiene	µg/kg	6000	44 U	49 U	47 U	45 U	45 U
Hexachlorocyclopentadiene	µg/kg	45000	190 U	210 U	200 U	190 U	190 U
Hexachloroethane	µg/kg	35000	190 U	210 U	200 U	190 U	190 U
Indeno(1,2,3-Cd)Pyrene	µg/kg	600	49 J	180 U	180 U	38 J	170 U
Indeno(1,2,3-Cd)Pyrene (SIM)	µg/kg	600	490	4.1 U	14	50 J	35 J
Isophorone	µg/kg	510000	190 U	210 U	200 U	190 U	190 U
Naphthalene	µg/kg	6000	46 J	210 U	200 U	190 U	190 U
Naphthalene (SIM)	µg/kg	6000	95 J	4.1 U	3.9	1.8 J	3.7 U
Nitrobenzene	µg/kg	31000	190 U	210 U	200 U	190 U	190 U
N-Nitroso-Di-N-Propylamine	µg/kg	200	76 U	85 U	81 U	77 U	78 U
N-Nitrosodiphenylamine	µg/kg	99000	190 U	210 U	200 U	190 U	190 U
Pentachlorophenol	µg/kg	3000	130 U	150 U	140 UJ	130 U	140 U
Pentachlorophenol (SIM)	µg/kg	3000	7.4 R	8.3 R	7.8 R	7.5 R	7.5 R
Phenanthrene	µg/kg	NL	81 J	210 U	200 U	26 J	190 U
Phenanthrene (SIM)	µg/kg	NL	170 J	4.1 U	10	31 J	19 J
Phenol	µg/kg	18000000	190 U	210 U	200 U	190 U	190 U
Pyrene	µg/kg	1700000	150 J	210 U	200 U	73 J	39 J
Pyrene (SIM)	µg/kg	1700000	260	4.1 U	27	73	55

NOTES

SIM - SVOCs were analyzed by low level analysis and by SIM analysis to meet the project action criteria listed in the QAPP

"T" in Location Indicates Transect number

CLP - Contract Laboratory Program

Exceedances highlighted in blue.

RBS-NJRDCSRS-Soil - NJDEP Residential Direct Contact Health Based

Criteria and Soil Remediation Standards. Revised November 4, 2009.

<http://www.state.nj.us/dep/erp/guidance/rs/>. Last accessed May 25, 2010

TABLE 5  
Test Excavation Data Summary  
Soil Sample Results – Semi-volatile Organic Compounds  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T6TP2-SS2	T7TP1-SS1	T7TP1-SS2	T8TP1-SS1	T8TP2-SS1
CLP Number			MB7Q36	B7Q43	B7Q44	B7Q51	MB7Q55
Location			T6-Test Pit2-Sample2	T7-Test Pit1-Sample1	T7-Test Pit1-Sample2	T8-Test Pit1-Sample1	T8-Test Pit2-Sample1
Area			Area-04	Area-01	Area-01	Area-01	Area-04
Date			5/3/2010	4/28/2010	4/28/2010	4/27/2010	5/4/2010
Start Depth			4	0	4	5	0
End Depth			5	2	5	6	2
Depth Units			ft	ft	ft	ft	ft
chemical_name	units	RBS-NJRDCSRS-Soil					
SEMIVOLATILE ORGANIC COMPOUNDS							
1,1'-Biphenyl	µg/kg	3100000	180 U	180 U	190 U	180 U	180 U
1,2,4,5-Tetrachlorobenzene	µg/kg	NL	180 U	180 U	190 U	180 U	180 U
2,4,5-Trichlorophenol	µg/kg	6100000	180 U	180 U	190 U	180 U	180 U
2,4,6-Trichlorophenol	µg/kg	19000	180 U	180 U	190 U	180 U	180 U
2,4-Dichlorophenol	µg/kg	180000	180 U	180 U	190 U	180 U	180 U
2,4-Dimethylphenol	µg/kg	1200000	35 U	36 U	38 U	36 U	35 U
2,4-Dinitrophenol	µg/kg	120000	65 U	66 U	70 U	66 U	65 U
2,4-Dinitrotoluene	µg/kg	700	35 U	36 U	38 U	36 U	35 U
2,6-Dinitrotoluene	µg/kg	700	180 U	180 U	190 U	180 U	180 U
2-Chloronaphthalene	µg/kg	NL	35 U	36 U	38 U	36 U	35 U
2-Chlorophenol	µg/kg	310000	180 U	180 U	190 U	180 U	180 U
2-Methylnaphthalene	µg/kg	230000	180 U	180 U	190 U	180 U	180 U
2-Methylnaphthalene (SIM)	µg/kg	230000	3.5 U	3.6 U	3.9	3.6 U	3.5 U
2-Methylphenol	µg/kg	310000	180 U	180 U	190 U	180 U	180 U
2-Nitroaniline	µg/kg	39000	350 U	360 U	380 U	360 U	350 U
2-Nitrophenol	µg/kg	NL	180 U	180 U	190 U	180 U	180 U
3,3'-Dichlorobenzidine	µg/kg	1000	180 U	180 U	190 U	180 U	180 U
3-Nitroaniline	µg/kg	NL	350 U	360 U	380 U	360 U	350 U
4,6-Dinitro-2-Methylphenol	µg/kg	6000	150 U	150 U	160 U	150 U	150 U
4-Bromophenyl Phenyl Ether	µg/kg	NL	180 U	180 U	190 U	180 U	180 U
4-Chloro-3-Methylphenol	µg/kg	NL	180 U	180 U	190 U	180 U	180 U
4-Chloroaniline	µg/kg	NL	180 U	180 U	190 U	180 U	180 U
4-Chlorophenyl Phenylether	µg/kg	NL	180 U	180 U	190 U	180 U	180 U
4-Methylphenol	µg/kg	31000	180 U	180 U	190 U	180 U	180 U
4-Nitroaniline	µg/kg	NL	350 U	360 U	380 U	360 U	350 U
4-Nitrophenol	µg/kg	NL	350 U	360 U	380 U	360 U	350 U
Acenaphthene	µg/kg	3400000	180 U	180 U	190 U	180 U	180 U
Acenaphthene (SIM)	µg/kg	NL	3.5 U	3.6 U	3.8 U	3.6 U	3.5 U
Acenaphthylene	µg/kg	NL	180 U	180 U	190 U	180 U	180 U
Acenaphthylene (SIM)	µg/kg	17000000	3.5 U	3.6 U	2.7 J	3.6 U	3.5 U
Acetophenone	µg/kg	2000	180 U	180 U	190 U	180 U	180 U
Anthracene	µg/kg	17000000	180 U	180 U	190 U	180 U	180 U
Anthracene (SIM)	µg/kg	3400000	3.5 U	3.6 U	3.6 J	3.6 U	3.5 U
Atrazine	µg/kg	210000	180 U	180 U	190 U	180 U	180 U
Benzaldehyde	µg/kg	6100000	180 U	180 U	190 U	180 U	180 U
Benzo(a)anthracene	µg/kg	600	160 U	160 U	23 J	160 U	160 U
Benzo(a)anthracene (SIM)	µg/kg	600	3.5 U	2.2 J	27 J	1.9 J	2.2 J
Benzo(a)pyrene	µg/kg	200	35 U	36 U	26 J	36 U	35 U
Benzo(a)pyrene (SIM)	µg/kg	200	3.5 U	3.6 U	29 J	3.6 U	3.5 U
Benzo(b)fluoranthene	µg/kg	600	160 U	160 U	33 J	160 U	160 U
Benzo(b)fluoranthene (SIM)	µg/kg	600	2.6 J	1.7 J	49	3.6 U	2.9 J
Benzo(g,h,i)perylene	µg/kg	380000000	180 U	180 U	32 J	180 U	180 U
Benzo(g,h,i)perylene (SIM)	µg/kg	380000000	3.9 U	3.6 U	23 J	3.6 U	3.6 U
Benzo(k)fluoranthene	µg/kg	6000	180 U	180 U	24 J	180 U	180 U
Benzo(k)fluoranthene (SIM)	µg/kg	6000	1.5 J	1 J	22 J	3.6 U	1.6 J
Bis(2-Chloroethoxy) methane	µg/kg	NL	180 U	180 U	190 U	180 U	180 U
Bis(2-Chloroethyl) ether	µg/kg	400	180 U	180 U	190 U	180 U	180 U
Bis(2-Ethylhexyl) phthalate	µg/kg	35000	180 U	180 U	190 U	180 U	37 J
Bis-Chloroisopropyl ether	µg/kg	23000	180 U	180 U	190 U	180 U	180 U
Butylbenzylphthalate	µg/kg	1200000	180 U	180 U	190 U	180 U	180 U
Caprolactam	µg/kg	31000000	180 U	180 U	190 U	180 U	180 U
Carbazole	µg/kg	24000	180 U	180 U	190 U	180 U	180 U
Chlorophenols	µg/kg	NL	180 U	180 U	190 U	180 U	180 U
Chrysene	µg/kg	62000	180 U	180 U	36 J	180 U	180 U
Chrysene (SIM)	µg/kg	62000	3.5 U	2 J	40	2 J	2 J
Dibenzo(a,h)anthracene	µg/kg	200	35 U	36 U	38 U	36 U	35 U
Dibenzo(a,h)anthracene (SIM)	µg/kg	200	3.5 UJ	3.6 U	8.3 J	3.6 U	3.5 UJ
Dibenzofuran	µg/kg	NL	180 U	180 U	190 U	180 U	180 U
Diethylphthalate	µg/kg	49000000	180 U	180 U	190 U	180 U	180 U
Dimethylphthalate	µg/kg	NL	180 U	180 U	190 U	180 U	180 U
Di-N-Butylphthalate	µg/kg	6100000	160 U	160 U	170 U	160 U	160 U
Di-N-Octyl Phthalate	µg/kg	2400000	180 U	180 U	190 U	180 U	180 U
Fluoranthene	µg/kg	2300000	180 U	180 U	38 J	180 U	180 U
Fluoranthene (SIM)	µg/kg	2300000	1.9 J	2.2 J	43	2.3 J	4.6
Fluorene	µg/kg	2300000	180 U	180 U	190 U	180 U	180 U
Fluorene (SIM)	µg/kg	2300000	3.5 U	3.6 U	3.8 U	3.6 U	3.5 U
Hexachlorobenzene	µg/kg	300	180 U	180 U	190 U	180 U	180 U
Hexachlorobutadiene	µg/kg	6000	43 U	43 U	46 U	43 U	42 U
Hexachlorocyclopentadiene	µg/kg	45000	180 U	180 U	190 U	180 U	180 U
Hexachloroethane	µg/kg	35000	180 U	180 U	190 U	180 U	180 U
Indeno(1,2,3-Cd)Pyrene	µg/kg	600	160 U	160 U	29 J	160 U	160 U
Indeno(1,2,3-Cd)Pyrene (SIM)	µg/kg	600	4.3 U	3.6 U	47 J	3.6 U	4.1 U
Isophorone	µg/kg	510000	180 U	180 U	190 U	180 U	180 U
Naphthalene	µg/kg	6000	180 U	180 U	190 U	180 U	180 U
Naphthalene (SIM)	µg/kg	6000	3.5 U	3.6 U	5.2	3.6 U	3.5 U
Nitrobenzene	µg/kg	31000	180 U	180 U	190 U	180 U	180 U
N-Nitroso-Di-N-Propylamine	µg/kg	200	74 U	74 U	79 U	75 U	73 U
N-Nitrosodiphenylamine	µg/kg	99000	180 U	180 U	190 U	180 U	180 U
Pentachlorophenol	µg/kg	3000	130 U	130 U	140 U	130 U	130 U
Pentachlorophenol (SIM)	µg/kg	3000	7.1 R	7.2 R	7.6 R	7.3 R	7.1 R
Phenanthrene	µg/kg	NL	180 U	180 U	190 U	180 U	180 U
Phenanthrene (SIM)	µg/kg	NL	3.5 U	3.6 U	23 J	3.6 U	6.8
Phenol	µg/kg	18000000	180 U	180 U	190 U	180 U	180 U
Pyrene	µg/kg	1700000	180 U	180 U	51 J	180 U	180 U
Pyrene (SIM)	µg/kg	1700000	3.6	4	49	3.8	6.5

NOTES

SIM - SVOCs were analyzed by low level analysis and by SIM analysis to meet the project action criteria listed in the QAPP

"T" in Location indicates Transact number

CLP - Contract Laboratory Program

Exceedances highlighted in blue.

RBS-NJRDCSRS-Soil - NJDEP Residential Direct Contact Health Based Criteria and Soil Remediation Standards. Revised November 4, 2009.  
<http://www.state.nj.us/dep/serp/guidance/rs/>. Last accessed May 25, 2010

**TABLE 5**  
**Test Excavation Data Summary**  
**Soil Sample Results – Semi-volatile Organic Compounds**  
**Raritan Bay Slag Superfund Site**  
**Old Bridge and Sayreville, NJ**

Sample Identification			T8TP2-SS2	T8TP3-SS1	T8TP3-SS2	T9TP1-SS1	T9TP2-SS1	T9TP2-SS2
CLP Number			MB7Q56	MB7Q59	MB7Q60	B7Q63	B7Q67	B7Q68
Location			T8-Test Pit2-Sample2	T8-Test Pit3-Sample1	T8-Test Pit3-Sample2	T9-Test Pit1-Sample1	T9-Test Pit2-Sample1	T9-Test Pit2-Sample2
Area			Area-04	Area-04	Area-04	Area-01	Area-04	Area-01
Date			5/4/2010	5/4/2010	5/4/2010	4/27/2010	4/28/2010	4/28/2010
Start Depth			7	2	4	5	1	0
End Depth			9	2.5	4.5	5.5	2	1.25
Depth Units			ft	ft	ft	ft	ft	ft
chemical_name	units	RBS-NJRDCSRS-Soil						
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>								
1,1'-Biphenyl	µg/kg	3100000	200 U	190 U	190 U	180 U	200 U	190 U
1,2,4,5-Tetrachlorobenzene	µg/kg	NL	200 U	190 U	190 U	180 U	200 U	190 U
2,4,5-Trichlorophenol	µg/kg	6100000	200 U	190 U	190 U	180 U	200 U	190 U
2,4,6-Trichlorophenol	µg/kg	19000	200 U	190 U	190 U	180 U	200 U	190 U
2,4-Dichlorophenol	µg/kg	180000	200 U	190 U	190 U	180 U	200 U	190 U
2,4-Dimethylphenol	µg/kg	1200000	39 U	36 U	36 U	35 U	39 U	36 U
2,4-Dinitrophenol	µg/kg	120000	71 U	67 U	67 U	64 U	71 U	66 U
2,4-Dinitrotoluene	µg/kg	700	39 U	36 U	36 U	35 U	39 U	36 U
2,6-Dinitrotoluene	µg/kg	700	200 U	190 U	190 U	180 U	200 U	190 U
2-Chloronaphthalene	µg/kg	NL	39 U	36 U	36 U	35 U	39 U	36 U
2-Chlorophenol	µg/kg	310000	200 U	190 U	190 U	180 U	200 U	190 U
2-Methylnaphthalene	µg/kg	230000	200 U	190 U	190 U	180 U	200 U	190 U
2-Methylnaphthalene (SIM)	µg/kg	230000	3.9 U	3.6 U	3.6 U	4.2	3.9 U	9.4
2-Methylphenol	µg/kg	310000	200 U	190 U	190 U	180 U	200 U	190 U
2-Nitroaniline	µg/kg	39000	390 U	360 U	360 U	350 U	390 U	360 U
2-Nitrophenol	µg/kg	NL	200 U	190 U	190 U	180 U	200 U	190 U
3,3'-Dichlorobenzidine	µg/kg	1000	200 U	190 U	190 U	180 U	200 U	190 U
3-Nitroaniline	µg/kg	NL	390 U	360 U	360 U	350 U	390 U	360 U
4,6-Dinitro-2-Methylphenol	µg/kg	6000	160 U	150 U	150 U	150 U	160 U	150 U
4-Bromophenyl Phenyl Ether	µg/kg	NL	200 U	190 U	190 U	180 U	200 U	190 U
4-Chloro-3-Methylphenol	µg/kg	NL	200 U	190 U	190 U	180 U	200 U	190 U
4-Chloroaniline	µg/kg	NL	200 U	190 U	190 U	180 U	200 U	190 U
4-Chlorophenyl Phenylether	µg/kg	NL	200 U	190 U	190 U	180 U	200 U	190 U
4-Methylphenol	µg/kg	31000	200 U	190 U	190 U	180 U	200 U	190 U
4-Nitroaniline	µg/kg	NL	390 U	360 U	360 U	350 U	390 U	360 U
4-Nitrophenol	µg/kg	NL	390 U	360 U	360 U	350 U	390 U	360 U
Acenaphthene	µg/kg	3400000	200 U	190 U	190 U	180 U	200 U	190 U
Acenaphthene (SIM)	µg/kg	NL	3.9 U	3.6 U	3.6 U	2.1 J	3.9 U	5.2
Acenaphthylene	µg/kg	NL	200 U	190 U	190 U	180 U	200 U	190 U
Acenaphthylene (SIM)	µg/kg	17000000	3.2 J	3.6 U	3.6 U	3.5	3.9 U	5
Acetophenone	µg/kg	2000	200 U	190 U	190 U	180 U	200 U	190 U
Anthracene	µg/kg	17000000	200 U	190 U	190 U	180 U	200 U	190 U
Anthracene (SIM)	µg/kg	3400000	4.1	3.6 U	3.6 U	5.1	3.9 U	11
Atrazine	µg/kg	210000	200 U	190 U	190 U	180 U	200 U	190 U
Benzaldehyde	µg/kg	6100000	200 U	190 U	190 U	180 U	200 U	190 U
Benzo(a)anthracene	µg/kg	600	33 J	160 U	170 U	30 J	180 U	49 J
Benzo(a)anthracene (SIM)	µg/kg	600	48	3 J	5.6	34 J	7.2	56 J
Benzo(a)pyrene	µg/kg	200	32 J	36 U	38 U	32 J	39 U	56 J
Benzo(a)pyrene (SIM)	µg/kg	200	42 J	5 U	7.2	33 J	9.6	59 J
Benzo(b)fluoranthene	µg/kg	600	31 J	160 U	170 U	35 J	180 U	63 J
Benzo(b)fluoranthene (SIM)	µg/kg	600	50	4.3	8.7	46	8.5	92
Benzo(g,h,i)perylene	µg/kg	380000000	23 J	190 U	190 U	29 J	200 U	63 J
Benzo(g,h,i)perylene (SIM)	µg/kg	380000000	22 J	4.2 U	5.4	19 J	7.4	80
Benzo(k)fluoranthene	µg/kg	6000	30 J	190 U	190 U	24 J	200 U	41 J
Benzo(k)fluoranthene (SIM)	µg/kg	6000	27 J	2 J	4.7	24 J	5.3	45 J
Bis(2-Chloroethoxy) methane	µg/kg	NL	200 U	190 U	190 U	180 U	200 U	190 U
Bis(2-Chloroethyl) ether	µg/kg	400	200 U	190 U	190 U	180 U	200 U	190 U
Bis(2-Ethylhexyl) phthalate	µg/kg	35000	200 U	190 U	25 J	180 U	200 U	190 U
Bis-Chloroisopropyl ether	µg/kg	23000	200 U	190 U	190 U	180 U	200 U	190 U
Butylbenzylphthalate	µg/kg	1200000	200 U	190 U	190 U	180 U	200 U	190 U
Caprolactam	µg/kg	31000000	200 U	190 U	190 U	180 U	200 U	190 U
Carbazole	µg/kg	24000	200 U	190 U	190 U	180 U	200 U	190 U
Chlorophenols	µg/kg	NL	200 U	190 U	190 U	180 U	200 U	190 U
Chrysene	µg/kg	62000	38 J	190 U	190 U	39 J	200 U	64 J
Chrysene (SIM)	µg/kg	62000	49	3 J	6.2	42	6.5	63 J
Dibenzo(a,h)anthracene	µg/kg	200	39 U	36 U	36 U	35 U	39 U	36 U
Dibenzo(a,h)anthracene (SIM)	µg/kg	200	11 J	3.6 U	3.6 U	7.8 J	4.4 J	15 J
Dibenzofuran	µg/kg	NL	200 U	190 U	190 U	180 U	200 U	190 U
Diethylphthalate	µg/kg	49000000	200 U	190 U	190 U	180 U	200 U	190 U
Dimethylphthalate	µg/kg	NL	200 U	190 U	190 U	180 U	200 U	190 U
Di-N-Butylphthalate	µg/kg	6100000	180 U	160 U	170 U	160 U	180 U	160 U
Di-N-Octyl Phthalate	µg/kg	2400000	200 U	190 U	190 U	180 U	200 U	190 U
Fluoranthene	µg/kg	2300000	65 J	190 U	190 U	73 J	200 U	96 J
Fluoranthene (SIM)	µg/kg	2300000	86	4.7	9.5	80	11	110
Fluorene	µg/kg	2300000	200 U	190 U	190 U	180 U	200 U	190 U
Fluorene (SIM)	µg/kg	2300000	3.9 U	3.6 U	3.6 U	2.5 J	3.9 U	6.9
Hexachlorobenzene	µg/kg	300	200 U	190 U	190 U	180 U	200 U	190 U
Hexachlorobutadiene	µg/kg	6000	47 U	44 U	44 U	42 U	47 U	44 U
Hexachlorocyclopentadiene	µg/kg	45000	200 U	190 U	190 U	180 U	200 U	190 U
Hexachloroethane	µg/kg	35000	200 U	190 U	190 U	180 U	200 U	190 U
Indeno(1,2,3-Cd)Pyrene	µg/kg	600	25 J	160 U	170 U	29 J	180 U	59 J
Indeno(1,2,3-Cd)Pyrene (SIM)	µg/kg	600	31 J	4.3 U	7	46 J	8.3 J	110 J
Isophorone	µg/kg	510000	200 U	190 U	190 U	180 U	200 U	190 U
Naphthalene	µg/kg	6000	200 U	190 U	190 U	180 U	200 U	190 U
Naphthalene (SIM)	µg/kg	6000	3.9 U	3.6 U	3.6 U	4.2	3.9 U	14
Nitrobenzene	µg/kg	31000	200 U	190 U	190 U	180 U	200 U	190 U
N-Nitroso-Di-N-Propylamine	µg/kg	200	81 U	76 U	76 U	72 U	81 U	75 U
N-Nitrosodiphenylamine	µg/kg	99000	200 U	190 U	190 U	180 U	200 U	190 U
Pentachlorophenol	µg/kg	3000	140 U	130 U	130 U	130 U	140 U	130 U
Pentachlorophenol (SIM)	µg/kg	3000	7.8 R	7.4 R	7.4 R	7 R	7.8 R	7.3 R
Phenanthrene	µg/kg	NL	32 J	190 U	190 U	43 J	200 U	67 J
Phenanthrene (SIM)	µg/kg	NL	46	3.8	7.8	50	7.6	75
Phenol	µg/kg	18000000	200 U	190 U	190 U	180 U	200 U	190 U
Pyrene	µg/kg	1700000	72 J	190 U	190 U	85 J	200 U	110 J
Pyrene (SIM)	µg/kg	1700000	110	6.8	13	81	15	110

**NOTES**

SIM - SVOCs were analyzed by low level analysis and by SIM analysis to meet the project action criteria listed in the QAPP

"T" in Location indicates Transect number

CLP - Contract Laboratory Program

Exceedances highlighted in blue.

RBS-NJRDCSRS-Soil - NJDEP Residential Direct Contact Health Based Criteria and Soil Remediation Standards. Revised November 4, 2009.

<http://www.state.nj.us/dep/srp/guidance/rs/>. Last accessed May 25, 2010

TABLE 6  
Test Excavation Data Summary  
Soil Sample Results – Pesticides and PCBs  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T10TP1-SS1	T10TP1-SS2	T11TP1-SS1	T11TP1-SS2	T11TP2-SS1	T11TP2-SS2	T11TP3-SS1	T11TP3-SS2
CLP Number			B7PW7	B7PW8	B7PX5	B7PX6	MB7PX9	MB7PY0	MB7PY3	MB7PY4
Location			T10-Test Pit1-Sample1	T10-Test Pit1-Sample2	T11-Test Pit1-Sample1	T11-Test Pit1-Sample2	T11-Test Pit2-Sample1	T11-Test Pit2-Sample2	T11-Test Pit3-Sample1	T11-Test Pit3-Sample2
Area			Area-01	Area-01	Area-04	Area-04	Area-04	Area-04	Area-04	Area-04
Date			4/28/2010	4/30/2010	4/29/2010	4/29/2010	5/4/2010	5/4/2010	5/4/2010	5/5/2010
Start Depth			0	4	0	5.5	0	5	0	5.5
End Depth			2	5	2	6	2	6	2.5	6
Depth Units			ft	ft	ft	ft	ft	ft	ft	ft
chemical_name	result_unit	RBS-NJRDCSRS-Soil								
PESTICIDES										
4,4'-DDD	µg/kg	3000	3.6 R	3.6 R	3.6 R	3.6 R	3.9 R	3.8 R	3.6 R	3.7 R
4,4'-DDE	µg/kg	2000	3.6 U	3.6 U	3.6 U	3.6 U	3.9 UJ	3.8 UJ	3.8 NJ	3.7 UJ
4,4'-DDT	µg/kg	2000	3.6 U	3.6 U	3.6 U	3.6 U	3.9 U	3.8 U	14 NJ	3.7 U
Aldrin	µg/kg	40	1.9 U	1.9 U	1.9 U	1.9 U	2 UJ	1.9 UJ	1.9 UJ	1.9 UJ
Alpha-Bhc	µg/kg	100	1.9 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U
Alpha-Chlordane	µg/kg	200	1.9 U	1.9 U	1.9 U	1.9 U	2 UJ	1.9 UJ	1.9 UJ	1.9 UJ
Beta-Bhc	µg/kg	400	1.9 U	1.9 U	1.9 U	1.9 U	2 UJ	1.9 UJ	1.9 UJ	1.9 UJ
Chlorinated Camphene	µg/kg	600	120 U	120 U	120 U	120 U	130 U	130 U	120 U	120 U
Delta-BHC	µg/kg	400	1.9 U	1.9 U	1.9 U	1.9 U	2 UJ	1.9 UJ	1.9 UJ	1.9 UJ
Dieldrin	µg/kg	40	3.6 U	3.6 U	3.6 U	3.6 U	3.9 U	3.8 U	3.4 J	3.7 U
Endosulfan I	µg/kg	470000	1.9 R	1.9 R	1.9 R	1.9 R	2 R	1.9 R	1.9 R	1.9 R
Endosulfan II	µg/kg	470000	3.6 U	3.6 U	3.6 U	3.6 U	3.9 UJ	3.8 UJ	3.9 J	3.7 UJ
Endosulfan Sulfate	µg/kg	470000	3.6 U	3.6 U	3.6 U	3.6 U	3.9 UJ	3.8 UJ	1.8 J	3.7 UJ
Endrin	µg/kg	23000	3.6 U	3.6 U	3.6 U	3.6 U	3.9 U	3.8 U	3.8 U	3.7 U
Endrin Aldehyde	µg/kg	23000	3.6 U	3.6 U	3.6 U	3.6 U	3.9 UJ	3.8 UJ	3.3 J	3.7 UJ
Endrin Ketone	µg/kg	23000	3.6 U	3.6 U	3.6 U	3.6 U	3.9 UJ	3.8 UJ	3.6 UJ	3.7 UJ
Gamma-Bhc (Lindane)	µg/kg	400	1.9 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U
Gamma-Chlordane	µg/kg	200	1.9 U	1.9 U	1.9 U	1.9 U	2 UJ	1.9 UJ	5.5 J	1.9 UJ
Heptachlor	µg/kg	100	1.9 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U
Heptachlor Epoxide	µg/kg	70	1.9 U	1.9 U	1.9 U	1.9 U	2 UJ	1.9 UJ	1.9 UJ	1.9 UJ
Methoxychlor	µg/kg	390000	19 U	19 U	19 U	19 U	20 U	19 U	19 U	19 U
PCBs										
Aroclor 1016	µg/kg	200	1.9 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U
Aroclor 1221	µg/kg	200	1.9 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U
Aroclor 1232	µg/kg	200	1.9 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U
Aroclor 1242	µg/kg	200	1.9 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U
Aroclor 1248	µg/kg	200	1.9 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U
Aroclor 1254	µg/kg	200	5	1.6 J	1.9 U	1.9 U	2 U	1.9 U	130	2.5
Aroclor 1260	µg/kg	200	1.9 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U
Aroclor 1262	µg/kg	200	1.9 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U
Aroclor 1268	µg/kg	200	1.9 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U

NOTES  
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µg/kg - microgram per kilogram  
U - non-detect  
J - estimated data due to exceeded quality control criteria  
R - data is rejected due to exceeded quality control criteria

**TABLE 6**  
**Test Excavation Data Summary**  
**Soil Sample Results – Pesticides and PCBs**  
**Raritan Bay Slag Superfund Site**  
**Old Bridge and Sayreville, NJ**

Sample Identification			T11TP4-SS1	T11TP5-SS2	T12TP1-SS1	T12TP1-SS2	T12TP2-SS1	T12TP3-SS1	T1TP1-SS1	T1TP2-SS2
CLP Number			MB7PY7	MB7PY8	B7PZ1	B7PZ2	B7PZ5	B7PZ6	B7PT5	B7PW0
Location			T11-Test Pit4-Sample1	T11-Test Pit5-Sample2	T12-Test Pit1-Sample1	T12-Test Pit1-Sample2	T12-Test Pit2-Sample1	T12-Test Pit3-Sample1	T1-Test Pit1-Sample1	T1-Test Pit2-Sample2
Area			Area-04	Area-04	Area-04	Area-04	Area-01	Area-04	Area-02	Area-02
Date			5/5/2010	5/5/2010	4/23/2010	4/23/2010	4/23/2010	4/23/2010	4/22/2010	4/22/2010
Start Depth			0	7	0	9.5	6.5	6	8.5	9.5
End Depth			2	7.5	2	10	7	6.5	9	10
Depth Units			ft	ft	ft	ft	ft	ft	ft	ft
chemical_name	result_unit	RBS-NJRDCSRS-Soil								
<b>PESTICIDES</b>										
4,4'-DDD	µg/kg	3000	3.8 R	4 R	3.8 R	3.6 R	3.5 R	3.6 R	4.1 R	3.9 R
4,4'-DDE	µg/kg	2000	3.8 UJ	4 UJ	3.8 U	3.6 U	3.5 U	3.6 U	4.1 U	3.9 U
4,4'-DDT	µg/kg	2000	3.8 U	4 U	3.8 U	3.6 U	3.5 U	3.6 U	4.1 U	3.9 U
Aldrin	µg/kg	40	2 UJ	2 UJ	2 U	1.9 U	1.8 U	1.9 UJ	2.1 U	2.1 U
Alpha-Bhc	µg/kg	100	2 U	2 U	2 U	1.9 U	1.8 U	1.9 U	2.1 U	2.1 U
Alpha-Chlordane	µg/kg	200	2 UJ	2 UJ	2 U	1.9 U	1.8 U	1.9 U	2.1 U	2.1 U
Beta-Bhc	µg/kg	400	2 UJ	2 UJ	2 U	1.9 U	1.8 U	1.9 U	2.1 U	2.1 U
Chlorinated Camphene	µg/kg	600	130 U	130 U	130 U	120 U	120 U	120 U	140 U	130 U
Delta-BHC	µg/kg	400	2 UJ	2 UJ	2 U	1.9 U	1.8 U	1.9 U	2.1 U	2.1 U
Dieldrin	µg/kg	40	3.8 U	4 U	3.8 U	3.6 U	3.5 U	3.6 UJ	4.1 U	3.9 U
Endosulfan I	µg/kg	470000	2 R	2 R	2 R	1.9 R	1.8 R	1.9 R	2.1 R	2.1 R
Endosulfan II	µg/kg	470000	3.8 UJ	4 UJ	3.8 U	3.6 U	3.5 U	3.6 U	4.1 U	3.9 U
Endosulfan Sulfate	µg/kg	470000	3.8 UJ	4 UJ	3.8 U	3.6 U	3.5 U	3.6 U	4.1 U	3.9 U
Endrin	µg/kg	23000	3.8 U	4 R	3.8 U	3.6 U	3.5 U	3.6 UJ	4.1 U	3.9 U
Endrin Aldehyde	µg/kg	23000	3.8 UJ	4 UJ	3.8 U	3.6 U	3.5 U	3.6 U	4.1 U	3.9 U
Endrin Ketone	µg/kg	23000	3.8 UJ	4 UJ	3.8 U	3.6 U	3.5 U	3.6 U	4.1 U	3.9 U
Gamma-Bhc (Lindane)	µg/kg	400	2 U	2 U	2 U	1.9 U	1.8 U	1.9 UJ	2.1 U	2.1 U
Gamma-Chlordane	µg/kg	200	2 UJ	2 UJ	2 U	1.9 U	1.8 U	1.9 U	2.1 U	2.1 U
Heptachlor	µg/kg	100	2 U	2 U	2 U	1.9 U	1.8 U	1.9 UJ	2.1 U	2.1 U
Heptachlor Epoxide	µg/kg	70	2 UJ	2 UJ	2 U	1.9 U	1.8 U	1.9 U	2.1 U	2.1 U
Methoxychlor	µg/kg	390000	20 U	20 U	20 U	19 U	18 U	19 U	21 U	21 U
<b>PCBs</b>										
Aroclor 1016	µg/kg	200	2 U	2.1 U	2 U	1.9 U	1.9 U	1.9 U	2.2 U	2.1 U
Aroclor 1221	µg/kg	200	2 U	2.1 U	2 U	1.9 U	1.9 U	1.9 U	2.2 U	2.1 U
Aroclor 1232	µg/kg	200	2 U	2.1 U	2 U	1.9 U	1.9 U	1.9 U	2.2 U	2.1 U
Aroclor 1242	µg/kg	200	2 U	2.1 U	2 U	1.9 U	1.9 U	1.9 U	2.2 U	2.1 U
Aroclor 1248	µg/kg	200	2 U	2.1 U	2 U	1.9 U	1.9 U	1.9 U	2.2 U	2.1 U
Aroclor 1254	µg/kg	200	2 U	2.1 U	2 U	1.9 U	45	1.9 U	2.2 U	2.1 U
Aroclor 1260	µg/kg	200	2 U	2.1 U	2 U	1.9 U	1.9 U	1.9 U	2.2 U	2.1 U
Aroclor 1262	µg/kg	200	2 U	2.1 U	2 U	1.9 U	1.9 U	1.9 U	2.2 U	2.1 U
Aroclor 1268	µg/kg	200	2 U	2.1 U	2 U	1.9 U	1.9 U	1.9 U	2.2 U	2.1 U

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µg/kg - microgram per kilogram

U - non-detected

J - estimated data due to exceeded quality control criteria

R - data is rejected due to exceeded quality control criteria

**TABLE 6**  
**Test Excavation Data Summary**  
**Soil Sample Results – Pesticides and PCBs**  
**Raritan Bay Slag Superfund Site**  
**Old Bridge and Sayreville, NJ**

Sample identification			T1TP3-SS1	T1TP3-SS2	T25TP9-SS1	T25TP9-SS2	T25TP9-SS3	T25TP9-SS4	T25TP9-SS5	T25TP9-SS6
CLP Number			B7PW3	B7PW4	B7PS8	B7PS9	B7PT0	B7PT1	MB7PT2	MB7PT3
Location			T1-Test Pit3-Sample1	T1-Test Pit3-Sample2	T1-Test Pit3-Sample2	T3-Test Pit1-Sample1	T7-Test Pit1-Sample2	T10-Test Pit1-Sample1	T6-Test Pit2-Sample1	T11-Test Pit3-Sample1
Area			Area-02	Area-02	Area-02	Area-01	Area-01	Area-01	Area-04	Area-04
Date			4/22/2010	4/22/2010	4/22/2010	4/26/2010	4/26/2010	4/30/2010	5/3/2010	5/5/2010
Start Depth			0	9.5	9.5	0	4	0	1	0
End Depth			2	10	10	2	5	2	2	2.5
Depth Units			ft	ft	ft	ft	ft	ft	ft	ft
chemical_name	result_unit	RBS-NJRDCSRS-Soil								
<b>PESTICIDES</b>										
4,4'-DDD	µg/kg	3000	3.6 R	3.8 R	3.9 R	3.7 R	3.5 R	3.6 R	3.8 R	3.7 R
4,4'-DDE	µg/kg	2000	3.6 U	3.8 U	3.9 U	3.7 U	3.5 UJ	3.6 U	3.8 U	11 NJ
4,4'-DDT	µg/kg	2000	3.6 U	3.8 U	3.9 U	3.7 U	3.5 UJ	3.6 U	8.6 NJ	40 JN
Aldrin	µg/kg	40	1.9 U	2 U	2 U	1.9 U	1.8 UJ	1.9 U	1.9 U	1.9 UJ
Alpha-Bhc	µg/kg	100	1.9 U	2 U	2 U	1.9 U	1.8 UJ	1.9 U	1.9 U	1.9 U
Alpha-Chlordane	µg/kg	200	1.9 U	2 U	2 U	1.9 U	1.8 UJ	1.9 U	1.9 U	1.9 UJ
Beta-Bhc	µg/kg	400	1.9 U	2 U	2 U	1.9 U	1.8 UJ	1.9 U	1.9 U	1.9 UJ
Chlorinated Camphene	µg/kg	600	120 U	130 U	130 U	120 U	120 UJ	120 U	130 U	120 U
Delta-BHC	µg/kg	400	1.9 U	2 U	2 U	1.9 U	1.8 UJ	1.9 U	1.9 U	1.9 UJ
Dieldrin	µg/kg	40	3.6 U	3.8 U	3.9 U	3.7 U	3.5 UJ	3.6 U	1.5 J	9.7 NJ
Endosulfan I	µg/kg	470000	1.9 R	2 R	2 R	1.9 R	1.8 R	1.9 R	1.9 R	1.9 R
Endosulfan II	µg/kg	470000	3.6 U	3.8 U	3.9 U	3.7 U	3.5 UJ	3.6 U	2.2 J	12 J
Endosulfan Sulfate	µg/kg	470000	3.6 U	3.8 U	3.9 U	3.7 U	3.5 UJ	3.6 U	3.8 U	5 J
Endrin	µg/kg	23000	3.6 U	3.8 U	3.9 U	3.7 U	3.5 UJ	3.6 U	3.8 U	6.4 NJ
Endrin Aldehyde	µg/kg	23000	3.6 U	3.8 U	3.9 U	3.7 U	3.5 UJ	3.6 U	3.8 U	8.7 J
Endrin Ketone	µg/kg	23000	3.6 U	3.8 U	3.9 U	3.7 U	3.5 UJ	3.6 U	3.8 U	3.7 UJ
Gamma-Bhc (Lindane)	µg/kg	400	1.9 U	2 U	2 U	1.9 U	1.8 UJ	1.9 U	1.9 U	1.9 U
Gamma-Chlordane	µg/kg	200	1.9 U	2 U	2 U	1.9 U	1.8 UJ	1.9 U	3.2 NJ	15 NJ
Heptachlor	µg/kg	100	1.9 U	2 U	2 U	1.9 U	1.8 UJ	1.9 U	1.9 U	1.9 U
Heptachlor Epoxide	µg/kg	70	1.9 U	2 U	2 U	1.9 U	1.8 UJ	1.9 U	1.9 U	1.9 UJ
Methoxychlor	µg/kg	390000	19 U	20 U	20 U	19 U	18 UJ	19 U	19 U	21 J
<b>PCBs</b>										
Aroclor 1016	µg/kg	200	1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	19 U
Aroclor 1221	µg/kg	200	1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	19 U
Aroclor 1232	µg/kg	200	1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	19 U
Aroclor 1242	µg/kg	200	1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	19 U
Aroclor 1248	µg/kg	200	1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	19 U
Aroclor 1254	µg/kg	200	1.9 U	2 U	2 U	54	3.3	7.1	3.6 J	1100
Aroclor 1260	µg/kg	200	1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	19 U
Aroclor 1262	µg/kg	200	1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	19 U
Aroclor 1268	µg/kg	200	1.9 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	19 U

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µg/kg - microgram per kilogram

U - non-detect

J - estimated data due to exceeded quality control criteria

R - data is rejected due to exceeded quality control criteria

TABLE 6  
Test Excavation Data Summary  
Soil Sample Results – Pesticides and PCBs  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T2TP1-SS1	T2TP2-SS2	T2TP2-SS3	T2TP2-SS4	T3TP1-SS1	T3TP1-SS2	T3TP1-SS3	T4TP1-SS1
CLP Number			MB7P29	B7Q04	B7Q05	B7Q06	B7Q07	B7Q08	B7Q09	B7Q15
Location			T2-Test Pit1-Sample1	T2-Test Pit2-Sample2	T2-Test Pit2-Sample3	T2-Test Pit2-Sample4	T3-Test Pit1-Sample1	T3-Test Pit1-Sample2	T3-Test Pit1-Sample3	T4-Test Pit1-Sample1
Area			Area-02	Area-02	Area-02	Area-02	Area-01	Area-01	Area-01	Area-01
Date			4/21/2010	4/21/2010	4/21/2010	4/22/2010	4/26/2010	4/26/2010	4/26/2010	4/26/2010
Start Depth			4	7.5	6.5	0	0	4	7.5	0
End Depth			4.5	8	7	1	2	4.5	8	2
Depth Units			ft	ft	ft	ft	ft	ft	ft	ft
chemical_name	result_unit	RBS-NJRDCSRS-Soil								
PESTICIDES										
4,4'-DDD	µg/kg	3000	3.5 R	3.7 R	3.9 R	3.4 R	3.6 R	3.6 R	3.8 R	3.7 R
4,4'-DDE	µg/kg	2000	3.5 U	3.7 U	3.9 U	3.4 U	3.6 U	3.6 U	3.8 U	3.7 U
4,4'-DDT	µg/kg	2000	3.5 U	3.7 U	3.9 U	3.4 U	3.6 U	3.6 U	3.8 U	3.7 U
Aldrin	µg/kg	40	1.8 U	2 U	2 U	1.8 U	1.9 U	1.9 U	2 U	1.9 U
Alpha-Bhc	µg/kg	100	1.8 U	2 U	2 U	1.8 U	1.9 U	1.9 U	2 U	1.9 U
Alpha-Chlordane	µg/kg	200	1.8 U	2 U	2 U	1.8 U	1.9 U	1.9 U	2 U	1.9 U
Beta-Bhc	µg/kg	400	1.8 U	2 U	2 U	1.8 U	1.9 U	1.9 U	2 U	1.9 U
Chlorinated Camphene	µg/kg	600	120 U	130 U	130 U	120 U	120 U	120 U	130 U	130 U
Delta-BHC	µg/kg	400	1.8 U	2 U	2 U	1.8 U	1.9 U	1.9 U	2 U	1.9 U
Dieldrin	µg/kg	40	3.5 U	3.7 U	3.9 U	3.4 U	3.6 U	3.6 U	3.8 U	3.7 U
Endosulfan I	µg/kg	470000	1.8 R	2 R	2 R	1.8 R	1.9 R	1.9 R	2 R	1.9 R
Endosulfan II	µg/kg	470000	3.5 U	3.7 U	3.9 U	3.4 U	3.6 U	3.6 U	3.8 U	3.7 U
Endosulfan Sulfate	µg/kg	470000	3.5 U	3.7 U	3.9 U	3.4 U	3.6 U	3.6 U	3.8 U	3.7 U
Endrin	µg/kg	23000	3.5 U	3.7 U	3.9 U	3.4 U	3.6 U	3.6 U	3.8 U	3.7 U
Endrin Aldehyde	µg/kg	23000	3.5 U	3.7 U	3.9 U	3.4 U	3.6 U	3.6 U	3.8 U	3.7 U
Endrin Ketone	µg/kg	23000	3.5 U	3.7 U	3.9 U	3.4 U	3.6 U	3.6 U	3.8 U	3.7 U
Gamma-Bhc (Lindane)	µg/kg	400	1.8 U	2 U	2 U	1.8 U	1.9 U	1.9 U	2 U	1.9 U
Gamma-Chlordane	µg/kg	200	1.8 U	2 U	2 U	1.8 U	1.9 U	1.9 U	2 U	1.9 U
Heptachlor	µg/kg	100	1.8 U	2 U	2 U	1.8 U	1.9 U	1.9 U	2 U	1.9 U
Heptachlor Epoxide	µg/kg	70	1.8 U	2 U	2 U	1.8 U	1.9 U	1.9 U	2 U	1.9 U
Methoxychlor	µg/kg	390000	18 U	20 U	20 U	18 U	19 U	19 U	20 U	19 U
PCBs										
Aroclor 1016	µg/kg	200	1.9 U	1.9 U	2 U	1.8 U	1.9 U	1.9 U	2 U	1.9 U
Aroclor 1221	µg/kg	200	1.9 U	1.9 U	2 U	1.8 U	1.9 U	1.9 U	2 U	1.9 U
Aroclor 1232	µg/kg	200	1.9 U	1.9 U	2 U	1.8 U	1.9 U	1.9 U	2 U	1.9 U
Aroclor 1242	µg/kg	200	1.9 U	1.9 U	2 U	1.8 U	1.9 U	1.9 U	2 U	1.9 U
Aroclor 1248	µg/kg	200	1.9 U	1.9 U	2 U	1.8 U	1.9 U	1.9 U	2 U	1.9 U
Aroclor 1254	µg/kg	200	1.9 U	1.9 U	2 U	1.8 U	74	3.9	2 U	11
Aroclor 1260	µg/kg	200	1.9 U	1.9 U	2 U	65	1.9 U	1.9 U	2 U	1.9 U
Aroclor 1262	µg/kg	200	1.9 U	1.9 U	2 U	1.8 U	1.9 U	1.9 U	2 U	1.9 U
Aroclor 1268	µg/kg	200	1.9 U	1.9 U	2 U	1.8 U	1.9 U	1.9 U	2 U	1.9 U

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**TABLE 6**  
**Test Excavation Data Summary**  
**Soil Sample Results -- Pesticides and PCBs**  
**Raritan Bay Slag Superfund Site**  
**Old Bridge and Sayreville, NJ**

Sample Identification			T4TP1-SS2	T4TP2-SS1	T4TP2-SS2	T5TP1-SS1	T5TP1-SS2	T6TP1-SS1	T6TP1-SS2	T6TP2-SS1
CLP Number			B7Q16	MB7Q19	MB7Q20	B7Q23	B7Q24	B7Q31	B7Q32	MB7Q35
Location			T4-Test Pit1-Sample2	T4-Test Pit2-Sample1	T4-Test Pit2-Sample2	T5-Test Pit1-Sample1	T5-Test Pit1-Sample2	T6-Test Pit1-Sample1	T6-Test Pit1-Sample2	T6-Test Pit2-Sample1
Area			Area-01	Area-04	Area-04	Area-01	Area-01	Area-01	Area-01	Area-04
Date			4/26/2010	5/3/2010	5/3/2010	4/29/2010	4/29/2010	4/27/2010	4/27/2010	5/3/2010
Start Depth			8	0	5	0	6		4	1
End Depth			8.5	2	6	7			4.5	2
Depth Units			ft	ft	ft	ft	ft		ft	ft
chemical_name	result_unit	RBS-NJRDCSRS-Soil								
<b>PESTICIDES</b>										
4,4'-DDD	µg/kg	3000	3.7 R	3.5 R	4 R	3.6 R	4 R	3.8 R	3.6 R	3.7 R
4,4'-DDE	µg/kg	2000	3.7 U	3.5 U	4 U	3.6 U	4 U	3.8 U	3.6 UJ	3.7 UJ
4,4'-DDT	µg/kg	2000	3.7 U	3.5 U	4 U	3.6 U	4 U	3.8 U	3.6 UJ	3.7 U
Aldrin	µg/kg	40	1.9 U	1.8 U	2.1 U	1.9 U	2.1 U	2 U	1.9 UJ	1.9 UJ
Alpha-Bhc	µg/kg	100	1.9 U	1.8 U	2.1 U	1.9 U	2.1 U	2 U	1.9 UJ	1.9 U
Alpha-Chlordane	µg/kg	200	1.9 U	1.8 U	2.1 U	1.9 U	2.1 U	2 U	1.9 UJ	1.9 UJ
Beta-Bhc	µg/kg	400	1.9 U	1.8 U	2.1 U	1.9 U	2.1 U	2 U	1.9 UJ	1.9 UJ
Chlorinated Camphene	µg/kg	600	130 U	120 U	130 U	120 U	140 U	130 U	120 UJ	120 U
Delta-BHC	µg/kg	400	1.9 U	1.8 U	2.1 U	1.9 U	2.1 U	2 U	1.9 UJ	1.9 UJ
Dieldrin	µg/kg	40	3.7 U	3.5 U	4 U	3.6 U	4 U	3.8 U	3.6 UJ	3.7 U
Endosulfan I	µg/kg	470000	1.9 R	1.8 R	2.1 R	1.9 R	2.1 R	2 R	1.9 R	1.9 R
Endosulfan II	µg/kg	470000	3.7 U	3.5 U	4 U	3.6 U	4 U	3.8 U	3.6 UJ	3.7 UJ
Endosulfan Sulfate	µg/kg	470000	3.7 U	3.5 U	4 U	3.6 U	4 U	3.8 U	3.6 UJ	3.7 UJ
Endrin	µg/kg	23000	3.7 U	3.5 U	4 U	3.6 U	4 U	3.8 U	3.6 UJ	3.7 U
Endrin Aldehyde	µg/kg	23000	3.7 U	3.5 U	4 U	3.6 U	4 U	3.8 U	3.6 UJ	3.7 UJ
Endrin Ketone	µg/kg	23000	3.7 U	3.5 U	4 U	3.6 U	4 U	3.8 U	3.6 UJ	3.7 UJ
Gamma-Bhc (Lindane)	µg/kg	400	1.9 U	1.8 U	2.1 U	1.9 U	2.1 U	2 U	1.9 UJ	1.9 U
Gamma-Chlordane	µg/kg	200	1.9 U	1.8 U	2.1 U	1.9 U	2.1 U	2 U	1.9 UJ	1.9 UJ
Heptachlor	µg/kg	100	1.9 U	1.8 U	2.1 U	1.9 U	2.1 U	2 U	1.9 UJ	1.9 U
Heptachlor Epoxide	µg/kg	70	1.9 U	1.8 U	2.1 U	1.9 U	2.1 U	2 U	1.9 UJ	1.9 UJ
Methoxychlor	µg/kg	390000	19 U	18 U	21 U	19 U	21 U	20 U	19 UJ	19 U
<b>PCBs</b>										
Aroclor 1016	µg/kg	200	1.9 U	1.8 U	2.1 U	1.9 U	2.1 U	2 U	1.9 U	1.9 U
Aroclor 1221	µg/kg	200	1.9 U	1.8 U	2.1 U	1.9 U	2.1 U	2 U	1.9 U	1.9 U
Aroclor 1232	µg/kg	200	1.9 U	1.8 U	2.1 U	1.9 U	2.1 U	2 U	1.9 U	1.9 U
Aroclor 1242	µg/kg	200	1.9 U	1.8 U	2.1 U	1.9 U	2.1 U	2 U	1.9 U	1.9 U
Aroclor 1248	µg/kg	200	1.9 U	1.8 U	2.1 U	1.9 U	2.1 U	2 U	1.9 U	1.9 U
Aroclor 1254	µg/kg	200	2.9	1.8 U	2.1 U	38	2.1 U	8.1	4.8	7 J
Aroclor 1260	µg/kg	200	1.9 U	1.8 U	2.1 U	1.9 U	2.1 U	2 U	1.9 U	1.9 U
Aroclor 1262	µg/kg	200	1.9 U	1.8 U	2.1 U	1.9 U	2.1 U	2 U	1.9 U	1.9 U
Aroclor 1268	µg/kg	200	1.9 U	1.8 U	2.1 U	1.9 U	2.1 U	2 U	1.9 U	1.9 U

NOTES

"T" in Location indicates Transect number

CLP - Contract Laboratory Program

Exceedances highlighted in blue.

RBS-NJRDCSRS-Soil - NJDEP Residential Direct Contact Health Based Criteria and Soil Remediation Standards. Revised November 4, 2009.

<http://www.state.nj.us/dep/srp/guidance/rs/>. Last accessed May 25, 2010

µg/kg - microgram per kilogram

U - non-detect

J - estimated data due to exceeded quality control criteria

R - data is rejected due to exceeded quality control criteria

TABLE 6  
Test Excavation Data Summary  
Soil Sample Results – Pesticides and PCBs  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T6TP2-SS2	T7TP1-SS1	T7TP1-SS2	T8TP1-SS1	T8TP2-SS1	T8TP2-SS2	T8TP3-SS1	T8TP3-SS2
CLP Number			MB7Q36	B7Q43	B7Q44	B7Q51	MB7Q55	MB7Q56	MB7Q59	MB7Q60
Location			T6-Test Pit2-Sample2	T7-Test Pit1-Sample1	T7-Test Pit1-Sample2	T8-Test Pit1-Sample1	T8-Test Pit2-Sample1	T8-Test Pit2-Sample2	T8-Test Pit3-Sample1	T8-Test Pit3-Sample2
Area			Area-04	Area-01	Area-01	Area-01	Area-04	Area-04	Area-04	Area-04
Date			5/3/2010	4/28/2010	4/28/2010	4/27/2010	5/4/2010	5/4/2010	5/4/2010	5/4/2010
Start Depth			4	0	4	5	0	7	2	4
End Depth			5	2	5	6	2	9	2.5	4.5
Depth Units			ft	ft	ft	ft	ft	ft	ft	ft
chemical_name	result_unit	RBS-NJRDCSRS-Soil								
PESTICIDES										
4,4'-DDD	µg/kg	3000	3.5 R	3.5 R	3.7 UJ	3.5 R	3.5 R	7.3 JN	3.6 R	3.6 R
4,4'-DDE	µg/kg	2000	3.5 UJ	3.5 U	3.7 UJ	3.5 U	3.5 UJ	9.1 J	3.6 UJ	3.6 UJ
4,4'-DDT	µg/kg	2000	3.5 U	3.5 U	24 NJ	3.5 U	3.5 U	20 J	3.6 U	3.6 U
Aldrin	µg/kg	40	1.8 UJ	1.8 U	1.9 UJ	1.8 U	1.8 UJ	2 UJ	1.9 UJ	1.9 UJ
Alpha-Bhc	µg/kg	100	1.8 U	1.8 U	1.9 UJ	1.8 U	1.8 U	2 U	1.9 U	1.9 U
Alpha-Chlordane	µg/kg	200	1.8 UJ	1.8 U	1.9 UJ	1.8 U	1.8 UJ	2 UJ	1.9 UJ	1.9 UJ
Beta-Bhc	µg/kg	400	1.8 UJ	1.8 U	1.9 UJ	1.8 U	1.8 UJ	2 UJ	1.9 UJ	1.9 UJ
Chlorinated Camphene	µg/kg	600	120 U	120 U	130 UJ	120 U	120 U	130 U	120 U	120 U
Delta-BHC	µg/kg	400	1.8 UJ	1.8 U	1.9 UJ	1.8 U	1.8 UJ	2 UJ	1.9 UJ	1.9 UJ
Dieldrin	µg/kg	40	3.5 U	3.5 U	13 J	3.5 U	3.5 U	3.9 U	3.6 U	3.6 U
Endosulfan I	µg/kg	470000	1.8 R	1.8 R	9.1 NJ	1.8 R	1.8 R	2 R	1.9 R	1.9 R
Endosulfan II	µg/kg	470000	3.5 UJ	3.5 U	7.6 NJ	3.5 U	3.5 UJ	3.9 U	3.6 UJ	3.6 UJ
Endosulfan Sulfate	µg/kg	470000	3.5 UJ	3.5 U	3.7 UJ	3.5 U	3.5 UJ	3.9 U	3.6 UJ	3.6 UJ
Endrin	µg/kg	23000	3.5 U	3.5 U	3.7 UJ	3.5 U	3.5 R	3.9 JN	3.6 U	3.6 R
Endrin Aldehyde	µg/kg	23000	3.5 UJ	3.5 U	6.3 J	3.5 U	3.5 UJ	3.9 UJ	3.6 UJ	3.6 UJ
Endrin Ketone	µg/kg	23000	3.5 UJ	3.5 U	3.7 UJ	3.5 U	3.5 UJ	3.9 UJ	3.6 UJ	3.6 UJ
Gamma-Bhc (Lindane)	µg/kg	400	1.8 U	1.8 U	1.9 UJ	1.8 U	1.8 U	2 U	1.9 U	1.9 U
Gamma-Chlordane	µg/kg	200	1.8 UJ	1.8 U	24 JN	1.8 U	1.8 UJ	2 UJ	1.9 UJ	1.9 UJ
Heptachlor	µg/kg	100	1.8 U	1.8 U	1.9 UJ	1.8 U	1.8 U	2 U	1.9 U	1.9 U
Heptachlor Epoxide	µg/kg	70	1.8 UJ	1.8 U	1.9 UJ	1.8 U	1.8 UJ	2 UJ	1.9 UJ	1.9 UJ
Methoxychlor	µg/kg	390000	18 U	18 U	19 UJ	18 U	18 U	20 U	19 U	19 U
PCBs										
Aroclor 1016	µg/kg	200	1.8 U	1.8 U	1.9 U	1.8 U	1.8 U	2 U	1.9 U	1.9 U
Aroclor 1221	µg/kg	200	1.8 U	1.8 U	1.9 U	1.8 U	1.8 U	2 U	1.9 U	1.9 U
Aroclor 1232	µg/kg	200	1.8 U	1.8 U	1.9 U	1.8 U	1.8 U	2 U	1.9 U	1.9 U
Aroclor 1242	µg/kg	200	1.8 U	1.8 U	1.9 U	1.8 U	1.8 U	2 U	1.9 U	1.9 U
Aroclor 1248	µg/kg	200	1.8 U	1.8 U	1.9 U	1.8 U	1.8 U	2 U	1.9 U	1.9 U
Aroclor 1254	µg/kg	200	1.8 U	1.8 U	170	1.8 U	1.8 U	2 U	1.9 U	1.9 U
Aroclor 1260	µg/kg	200	1.8 U	1.8 U	1.9 U	1.8 U	1.8 U	2 U	1.9 U	1.9 U
Aroclor 1262	µg/kg	200	1.8 U	1.8 U	1.9 U	1.8 U	1.8 U	2 U	1.9 U	1.9 U
Aroclor 1268	µg/kg	200	1.8 U	1.8 U	1.9 U	1.8 U	1.8 U	2 U	1.9 U	1.9 U

NOTES  
"T" in Location indicates Transect number  
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Exceedances highlighted in blue.  
RBS-NJRDCSRS-Soil - NJDEP Residential Direct Contact Health Based  
Criteria and Soil Remediation Standards. Revised November 4, 2009.  
<http://www.state.nj.us/dep/srp/guidance/rs/>. Last accessed May 25, 2010  
µg/kg - microgram per kilogram  
U - non-detect  
J - estimated data due to exceeded quality control criteria  
R - data is rejected due to exceeded quality control criteria

**TABLE 6**  
**Test Excavation Data Summary**  
**Soil Sample Results – Pesticides and PCBs**  
**Raritan Bay Slag Superfund Site**  
**Old Bridge and Sayreville, NJ**

Sample Identification			T9TP1-SS1	T9TP2-SS1	T9TP2-SS2
CLP Number			B7Q63	B7Q67	B7Q68
Location			T9-Test Pit1-Sample1	T9-Test Pit2-Sample1	T9-Test Pit2-Sample2
Area			Area-01	Area-04	Area-01
Date			4/27/2010	4/28/2010	4/28/2010
Start Depth			5	1	0
End Depth			5.5	2	1.25
Depth Units			ft	ft	ft
chemical_name	result_unit	RBS-NJRDCSRS-Soil			
<b>PESTICIDES</b>					
4,4'-DDD	µg/kg	3000	3.4 R	3.8 R	3.6 R
4,4'-DDE	µg/kg	2000	3.4 U	3.8 U	3.6 U
4,4'-DDT	µg/kg	2000	3.4 U	3.8 U	3.6 U
Aldrin	µg/kg	40	1.8 U	2 U	1.8 U
Alpha-Bhc	µg/kg	100	1.8 U	2 U	1.8 U
Alpha-Chlordane	µg/kg	200	1.8 U	2 U	1.8 U
Beta-Bhc	µg/kg	400	1.8 U	2 U	1.8 U
Chlorinated Camphene	µg/kg	600	120 U	130 U	120 U
Delta-BHC	µg/kg	400	1.8 U	2 U	1.8 U
Dieldrin	µg/kg	40	3.4 U	3.8 U	2.8 J
Endosulfan I	µg/kg	470000	1.8 R	2 R	1.8 R
Endosulfan II	µg/kg	470000	3.4 U	3.8 U	3.6 U
Endosulfan Sulfate	µg/kg	470000	3.4 U	3.8 U	3.6 U
Endrin	µg/kg	23000	3.4 U	3.8 U	2 J
Endrin Aldehyde	µg/kg	23000	3.4 U	3.8 U	3.6 U
Endrin Ketone	µg/kg	23000	3.4 U	3.8 U	3.6 U
Gamma-Bhc (Lindane)	µg/kg	400	1.8 U	2 U	1.8 U
Gamma-Chlordane	µg/kg	200	1.8 U	2 U	3.7 J
Heptachlor	µg/kg	100	1.8 U	2 U	1.8 U
Heptachlor Epoxide	µg/kg	70	1.8 U	2 U	1.8 U
Methoxychlor	µg/kg	390000	18 U	20 U	18 U
<b>PCBs</b>					
Aroclor 1016	µg/kg	200	1.8 U	2 U	1.9 U
Aroclor 1221	µg/kg	200	1.8 U	2 U	1.9 U
Aroclor 1232	µg/kg	200	1.8 U	2 U	1.9 U
Aroclor 1242	µg/kg	200	1.8 U	2 U	1.9 U
Aroclor 1248	µg/kg	200	1.8 U	2 U	1.9 U
Aroclor 1254	µg/kg	200	6.5	3.1	58
Aroclor 1260	µg/kg	200	1.8 U	2 U	1.9 U
Aroclor 1262	µg/kg	200	1.8 U	2 U	1.9 U
Aroclor 1268	µg/kg	200	1.8 U	2 U	1.9 U

**NOTES**

"T" in Location indicates Transect number

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Exceedances highlighted in blue.

RBS-NJRDCSRS-Soil - NJDEP Residential Direct Contact Health Based

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<http://www.state.nj.us/dep/srp/guidance/rs/>. Last accessed May 25, 2010

µg/kg - microgram per kilogram

U - non-detected

J - estimated data due to exceeded quality control criteria

R - data is rejected due to exceeded quality control criteria

TABLE 7  
Test Excavation Data Summary  
Soil Sample Results - Metals and Wet Chemistry  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T10TP1-SS1	T10TP1-SS2	T11TP1-SS1	T11TP1-SS2	T11TP2-SS1	T11TP2-SS2	T11TP3-SS1
CLP Number			B7PW7	B7PW8	B7PX5	B7PX6	MB7PX9	MB7PY0	MB7PY3
Location			T10-Test Pit1-Sample1	T10-Test Pit1-Sample2	T11-Test Pit1-Sample1	T11-Test Pit1-Sample2	T11-Test Pit1-Sample1	T11-Test Pit2-Sample2	T11-Test Pit3-Sample1
Area			Area-01	Area-01	Area-04	Area-04	Area-04	Area-04	Area-04
Date			4/28/2010	4/30/2010	4/29/2010	4/29/2010	5/4/2010	5/4/2010	5/4/2010
Start Depth			0	4	0	5.5	0	5	0
End Depth			2	5	2	6	2	6	2.5
Depth Units			ft	ft	ft	ft	ft	ft	ft
chemical_name	result_unit	RBS-NJRDCSRS-Soil							
METALS									
Aluminum	mg/kg	78000	1550	1350	1920	1100	1020	1200	1880
Antimony	mg/kg	31	0.81 J	0.77	0.38 R	0.15 R	0.78	0.13	7.2 J
Arsenic	mg/kg	19	4 J	4.9	4.3 J	4.3 J	3.7	8.3	80.2 J
Barium	mg/kg	16000	7.7 J	11.8 J	7.4	4.7	6.7 J	5.9 J	9.5 J
Beryllium	mg/kg	16	0.47 U	0.16 J	0.14 J	0.075 J	0.58 U	0.59 U	0.58 U
Cadmium	mg/kg	78	0.043	0.082	0.029	0.029	0.039	0.092	0.1
Calcium	mg/kg	NL	469 U	509 U	544 U	531 U	577 U	587 U	580 U
Chromium	mg/kg	120000*	5.3	6.2	7.6	5.7	5.8	11.7	5.3
Chromium (Hexavalent Compounds)	mg/kg	240*	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1	1.1	1.1
Cobalt	mg/kg	1600	0.8	0.84	0.68 J	0.53 J	0.45	0.75	0.9 J
Copper	mg/kg	3100	14.4	7.8	3.1 J	1.5 J	7.6	7.5	325 R
Cyanide	mg/kg	1600	1.4 U	1.4 U	1.5 U	1.4 U	1.5 U	1.5 U	1.5 U
Iron	mg/kg	NL	8500 J	13600 J	14800	10800	9250 J	17600 J	14600 J
Lead	mg/kg	400	17.3 J	35.1 J	7.9 J	5 J	18.5 J	8.2 J	28.1 J
Magnesium	mg/kg	NL	469 U	509 U	544 U	531 U	577 U	587 U	580 U
Manganese	mg/kg	11000	20.3	12.2	26.1	12	9.7	13.6	23.6 J
Mercury	mg/kg	23	0.028 U	0.026 U	0.06	0.027 U	0.029 U	0.029 U	0.029 U
Nickel	mg/kg	1600	0.8 J	0.75 J	4.4 U	4.2 U	4.6 U	4.7 U	4.6 U
Potassium	mg/kg	NL	101 J	111 J	125 J	93.2 J	92.9 J	130 J	105 J
Selenium	mg/kg	390	0.16	0.075	0.19 J	0.14 J	0.12	0.21	0.3
Silver	mg/kg	390	0.94 U	1 U	0.095 J	0.094 J	1.2 U	1.2 U	1.2 U
Sodium	mg/kg	NL	469 U	509 U	544 U	531 U	577 U	587 U	580 U
Thallium	mg/kg	5	0.036	0.059	0.067 U	0.074 U	0.031	0.094	0.029
Vanadium	mg/kg	78	10.1	15.2	12.2	13	9.9	19.6	10.8
Zinc	mg/kg	23000	8.4	11	8.9	7.1	9.7	9.4	16.2
WET CHEMISTRY									
pH	su	NL				3.11			
Solids, Percent	%	NL	88.7	90.6	87.3	88.3	94.5	88.6	87.3
Total Organic Carbon	mg/kg	NL				2106 J			

"T" in Location indicates Transect number

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SU - Standard Units

Exceedances highlighted in blue.

RBS-NJRDCSRS-Soil - NJDEP Residential Direct Contact Health Based

Criteria and Soil Remediation Standards. Revised November 4, 2009.

<http://www.state.nj.us/dep/srp/guidance/rs/>. Last accessed May 25, 2010

1 - NJDEP Residential Direct Contact Health Based Criteria and Soil Remediation

Standards. Revised November 4, 2009.

<http://www.state.nj.us/dep/srp/guidance/rs/>. Last accessed May 25, 2010

\* - NJDEP Soil Cleanup Criteria (mg/kg), <http://www.nj.gov/dep/srp/guidance/scc/>.

Revised 12 May 1999. Last accessed June 25, 2010.

mg/kg - milligrams per kilogram

NL - not listed

U - non-detect

J - estimated data due to exceeded quality control criteria

R - data is rejected due to exceeded quality control criteria

TABLE 7  
Test Excavation Data Summary  
Soil Sample Results - Metals and Wet Chemistry  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T11TP3-SS2	T11TP4-SS1	T11TP5-SS2	T12TP1-SS1	T12TP1-SS2	T12TP2-SS1	T12TP3-SS1
CLP Number			MB7PY4	MB7PY7	MB7PY8	B7PZ1	B7PZ2	B7PZ5	B7PZ6
Location			T11-Test Pit3-Sample2	T11-Test Pit4-Sample1	T11-Test Pit5-Sample2	T12-Test Pit1-Sample1	T12-Test Pit1-Sample2	T12-Test Pit2-Sample1	T12-Test Pit3-Sample1
Area			Area-04	Area-04	Area-04	Area-04	Area-04	Area-01	Area-04
Date			5/5/2010	5/5/2010	5/5/2010	4/23/2010	4/23/2010	4/23/2010	4/23/2010
Start Depth			5.5	0	7	0	9.5	6.5	6
End Depth			6	2	7.5	2	10	7	6.5
Depth Units			ft	ft	ft	ft	ft	ft	ft
chemical_name	result_unit	RBS-NJRDCSRS-Soil							
METALS									
Aluminum	mg/kg	78000	998	418	1220	713 J	2570 J	882 J	2100 J
Antimony	mg/kg	31	0.19	0.04	0.099	2 J	1.2 J	4 J	0.098 J
Arsenic	mg/kg	19	2.8	2.8	4	2.7 J	9.9 J	4 J	1.4 J
Barium	mg/kg	16000	6.6 J	1.4 J	7.2 J	9.4 J	6.1 J	3.3 J	13.7 J
Beryllium	mg/kg	16	0.52 U	0.53 U	0.56 U	0.51 U	0.52 U	0.5 U	0.6 U
Cadmium	mg/kg	78	0.046	0.043	0.063	0.052 J	0.079 J	0.035 J	0.034 J
Calcium	mg/kg	NL	523 U	529 U	558 U	506 U	523 U	496 U	559 U
Chromium	mg/kg	120000*	4.8	4.1	10.9	6.1 R	16.7 R	3.6 R	3.8 R
Chromium (Hexavalent Compounds)	mg/kg	240*	1.1	1.2		1.1 UJ	1.2 UJ	1.1 UJ	1.1 UJ
Cobalt	mg/kg	1600	0.86	0.58	0.82	10.8 J	1.1 J	0.13 J	0.71 J
Copper	mg/kg	3100	6.3	3.6	8.9	4.3	11.1	8.2	4.4
Cyanide	mg/kg	1600	1.4 U	1.6 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U
Iron	mg/kg	NL	12500 J	11800 J	11400 J	7740 J	48300 J	19400 J	17100 J
Lead	mg/kg	400	4.6 J	2.3 J	6.1 J	72.5 J	29.5 J	107 J	5.3 J
Magnesium	mg/kg	NL	523 U	529 U	558 U	506 U	523 U	496 U	559 U
Manganese	mg/kg	11000	14	4.1	10.1	19.7 J	62.1 J	68.7 J	34.3 J
Mercury	mg/kg	23	0.028 U	0.031 U	0.028 U	0.027 U	0.028 U	0.028 U	0.028 U
Nickel	mg/kg	1600	4.2 U	4.2 U	4.5 U	4 U	4.2 U	4 U	4.5 U
Potassium	mg/kg	NL	58.2 J	31 J	91.5 J	506 U	523 U	496 U	559 U
Selenium	mg/kg	390	0.021	0.12 U	0.17	0.1 J	0.36 J	0.039 J	0.06 J
Silver	mg/kg	390	1 U	1.1 U	1.1 U	1 U	1 U	0.99 U	1.1 U
Sodium	mg/kg	NL	523 U	529 U	558 U	506 U	523 U	496 U	559 U
Thallium	mg/kg	5	0.029	0.012	0.062	0.067 UJ	0.07 UJ	0.066 UJ	0.067 UJ
Vanadium	mg/kg	78	10.7	8	18	11.9 R	57.4 R	6.3 R	8.3 R
Zinc	mg/kg	23000	10.3	7.9	9.6	41.3	28.3	12.5	11.7
WET CHEMISTRY									
pH	su	NL		3.66			3.96	5.26	
Solids, Percent	%	NL	90	85.9		90.1	83.6	90.8	90.2
Total Organic Carbon	mg/kg	NL		1413 J			1487 J	1441 J	

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\* - NJDEP Soil Cleanup Criteria (mg/kg). <http://www.nj.gov/dep/srp/guidance/sccl/>.  
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mg/kg - milligrams per kilogram  
NL - not listed  
U - non-detect  
J - estimated data due to exceeded quality control criteria  
R - data is rejected due to exceeded quality control criteria

TABLE 7  
Test Excavation Data Summary  
Soil Sample Results - Metals and Wet Chemistry  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T1TP1-SS1	T1TP2-SS2	T1TP3-SS1	T1TP3-SS2	T25TP9-SS1	T25TP9-SS2	T25TP9-SS3
CLP Number			B7PT5	B7PW0	B7PW3	B7PW4	B7PS8	B7PS9	B7PT0
Location			T1-Test Pit1-Sample1	T1-Test Pit2-Sample2	T1-Test Pit3-Sample1	T1-Test Pit3-Sample2	uplicate of T1-Test Pit3-Samp	uplicate of T3-Test Pit1-Samp	uplicate of T7-Test Pit1-Samp
Area			Area-02	Area-02	Area-02	Area-02	Area-02	Area-01	Area-01
Date			4/22/2010	4/22/2010	4/22/2010	4/22/2010	4/22/2010	4/26/2010	4/28/2010
Start Depth			8.5	9.5	0	9.5	9.5	0	4
End Depth			9	10	2	10	10	2	5
Depth Units			ft	ft	ft	ft	ft	ft	ft
chemical_name	result_unit	RBS-NJRDCSRS-Soil							
METALS									
Aluminum	mg/kg	78000	530 J	1790 J	1420 J	5120 J	3640 J	2070 J	1960
Antimony	mg/kg	31	0.18 UJ	9 J	0.22 J	0.32 J	0.43 J	53.3 J	0.33 R
Arsenic	mg/kg	19	1.1 J	67.4 J	1.2 J	6.5 J	6.3 J	21.4 J	2.2 J
Barium	mg/kg	16000	3.6 J	19.2 J	12.7 J	35.7 J	34.1 J	144 J	9.9
Beryllium	mg/kg	16	0.06 J	0.16 J	0.089 J	0.89	0.43 J	0.2 J	0.12 J
Cadmium	mg/kg	78	0.025 UJ	0.14 J	0.1 J	0.16 J	0.11 J	0.37 J	0.094
Calcium	mg/kg	NL	428 U	516 U	469 U	888	892	542	524 U
Chromium	mg/kg	120000*	1.8 R	5.9 R	4.4 R	12.9 R	10.8 R	10.5 R	5
Chromium (Hexavalent Compounds)	mg/kg	240*	1.3 UJ	1.2 UJ	1.1 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.1 UJ
Cobalt	mg/kg	1600	0.15 J	0.81 J	0.68 J	2.7 J	2.6 J	1.6 J	0.84 J
Copper	mg/kg	3100	1.3 J	5.8	2.6	14.9	11.9	40.1	17.5
Cyanide	mg/kg	1600	1.5 U	1.5 U	1.4 U	1.6 U	1.5 U	1.4 U	1.4 U
Iron	mg/kg	NL	1940 J	4840 J	4890 J	11700 J	14100 J	12200 J	7810 J
Lead	mg/kg	400	4.7 J	296 J	23.2 J	20.2 J	19.7 J	1390 J	12.9 J
Magnesium	mg/kg	NL	428 U	516 U	469 U	1150	760	533 U	524 U
Manganese	mg/kg	11000	4.3 J	12.9 J	5.8 J	54 J	36.7 J	37.4 J	19.2
Mercury	mg/kg	23	0.032 U	0.031 U	0.028 U	0.03 U	0.038	0.027 U	0.028 UJ
Nickel	mg/kg	1600	3.4 U	4 U	3.8 U	13.4	7.3	4.6	4.2 U
Potassium	mg/kg	NL	428 U	516 U	469 U	931	668	533 U	120 J
Selenium	mg/kg	390	0.047 J	0.26 J	0.18 J	0.4 J	0.49 J	0.51 J	0.16 J
Silver	mg/kg	390	0.86 U	1 U	0.94 U	1 U	0.15 J	1.1 U	0.082 J
Sodium	mg/kg	NL	428 U	516 U	469 U	512 U	514 U	533 U	524 U
Thallium	mg/kg	5	0.075 UJ	0.071 UJ	0.067 UJ	0.09 J	0.093 J	0.091 J	0.065 UJ
Vanadium	mg/kg	78	3.8 R	11 R	8.5 R	29.7 R	20 R	19 R	10.7
Zinc	mg/kg	23000	4.6 J	16.4	6.9	58	39.9	26.6	10.2
WET CHEMISTRY									
pH	su	NL							
Solids, Percent	%	NL	79.3	81.5	87.5	82.5	82.5	84.2	92.7
Total Organic Carbon	mg/kg	NL							

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Exceedances highlighted in blue.  
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TABLE 7  
Test Excavation Data Summary  
Soil Sample Results - Metals and Wet Chemistry  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T25TP9-SS4	T25TP9-SS5	T25TP9-SS6	T2TP1-SS1	T2TP2-SS2	T2TP2-SS3	T2TP2-SS4
CLP Number			B7PT1	MB7PT2	MB7PT3	MB7PZ9	B7Q04	B7Q05	B7Q06
Location			uplicate of T10-Test Pit1-Sam	uplicate of T6-Test Pit2-Sam	uplicate of T11-Test Pit3-Sam	T2-Test Pit1-Sample1	T2-Test Pit2-Sample2	T2-Test Pit2-Sample3	T2-Test Pit2-Sample4
Area			Area-01	Area-04	Area-04	Area-02	Area-02	Area-02	Area-02
Date			4/30/2010	5/3/2010	5/5/2010	4/21/2010	4/21/2010	4/21/2010	4/22/2010
Start Depth			0	1	0	4	7.5	6.5	0
End Depth			2	2	2.5	4.5	8	7	1
Depth Units			ft	ft	ft	ft	ft	ft	ft
chemical_name	result_unit	RBS-NJRDCSRS-Soil							
METALS									
Aluminum	mg/kg	78000	1630	2040 J	1420	713 J	4220 J	4000 J	1170 J
Antimony	mg/kg	31	2.8 J	1 J	2.3 J	2.5 J	0.15 J	0.85 J	15.4 J
Arsenic	mg/kg	19	7.3 J	3.8	24.4 J	1.8 J	4.8 J	3.2 J	7.8 J
Barium	mg/kg	16000	14.5 J	9 J	12.5 J	5.6 J	17.6 J	14 J	8.6 J
Beryllium	mg/kg	16	0.16 J	0.18 J	0.59 U	0.51 U	0.43 U	0.49 U	0.16 J
Cadmium	mg/kg	78	0.054	0.074	0.078	0.11 J	0.065 J	0.04 J	0.071 J
Calcium	mg/kg	NL	533 U	501 U	586 U	506 U	426 U	491 U	523 U
Chromium	mg/kg	120000*	6.7	6.9	5.9	3.3 R	11.2 R	9.7 R	5.3 R
Chromium (Hexavalent Compounds)	mg/kg	240*	1.1 UJ	1.1	1.2	1.3 UJ	1.2 UJ	1.2 UJ	1.1 UJ
Cobalt	mg/kg	1600	0.93	0.65	1.3 J	0.37 J	1.8 J	0.62 J	0.4 J
Copper	mg/kg	3100	12.3	10	43.5 R	4.3	5.5	5	13.9
Cyanide	mg/kg	1600	1.5 U	1.4 U	1.6 U	1.3 U	1.4 U	1.5 U	1.3 U
Iron	mg/kg	NL	9430 J	11600 J	8150 J	7740 J	8510 J	6800 J	9580 J
Lead	mg/kg	400	22.4 J	33 J	15.4 J	24.1 J	8.1 J	26.3 J	266 J
Magnesium	mg/kg	NL	533 U	501 U	586 U	506 U	426 U	491 U	523 U
Manganese	mg/kg	11000	18.6	31.5 J	15.3 J	19.7 J	14 J	14.7 J	19.1 J
Mercury	mg/kg	23	0.02 J	0.023 J	0.03 U	0.028 U	0.028 U	0.03 U	0.026 U
Nickel	mg/kg	1600	0.63 J	1.7 J	4.7 U	4 U	3.4 U	3.9 U	4.2 U
Potassium	mg/kg	NL	114 J	119 J	84.5 J	506 U	426 U	491 U	523 U
Selenium	mg/kg	390	0.21	0.15	0.13	0.072 J	0.19 J	0.16 J	0.14 J
Silver	mg/kg	390	1.1 U	1 U	1.2 U	1 U	0.85 U	0.98 U	0.098 J
Sodium	mg/kg	NL	533 U	501 U	589 U	506 U	426 U	491 U	523 U
Thallium	mg/kg	5	0.073	0.035	0.034	0.067 UJ	0.069 UJ	0.073 UJ	0.063 UJ
Vanadium	mg/kg	78	13.7	12.6	11.3	5.8 R	25.4 R	23.1 R	8.5 R
Zinc	mg/kg	23000	9.2	13.7	8.3	41.3	12.1	10.5	20.2
WET CHEMISTRY									
pH	su	NL							
Solids, Percent	%	NL	89.5	89.1	85.4	78.4	81.6	82.6	93.7
Total Organic Carbon	mg/kg	NL							

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TABLE 7  
Test Excavation Data Summary  
Soil Sample Results - Metals and Wet Chemistry  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T3TP1-SS1	T3TP1-SS2	T3TP1-SS3	T4TP1-SS1	T4TP1-SS2	T4TP2-SS1	T4TP2-SS2
CLP Number			B7Q07	B7Q08	B7Q09	B7Q15	B7Q16	MB7Q19	MB7Q20
Location			T3-Test Pit1-Sample1	T3-Test Pit1-Sample2	T3-Test Pit1-Sample3	T4-Test Pit1-Sample1	T4-Test Pit1-Sample2	T4-Test Pit2-Sample1	T4-Test Pit2-Sample2
Area			Area-01	Area-01	Area-01	Area-01	Area-01	Area-04	Area-04
Date			4/26/2010	4/26/2010	4/26/2010	4/26/2010	4/26/2010	5/3/2010	5/3/2010
Start Depth			0	4	7.5	0	8	0	5
End Depth			2	4.5	8	2	8.5	2	6
Depth Units			ft	ft	ft	ft	ft	ft	ft
chemical_name	result_unit	RBS-NJRDCSRs-Soil							
METALS									
Aluminum	mg/kg	78000	2460 J	966 J	487 J	1530 J	948 J	490	370
Antimony	mg/kg	31	35 J	2.8 J	0.16 UJ	80.5 J	0.95 J	0.11	0.034
Arsenic	mg/kg	19	25 J	3.4 J	1.2 J	7 J	1.8 J	4	0.55
Barium	mg/kg	16000	54.9 J	7.5 J	3.3 J	13 J	8.6 J	8.5 J	3.9 J
Beryllium	mg/kg	16	0.25 J	0.093 J	0.081 J	0.12 J	0.096 J	0.11 J	0.61 U
Cadmium	mg/kg	78	0.47 J	0.065 J	0.03 J	0.14 J	0.056 J	0.03	0.017
Calcium	mg/kg	NL	573	526 U	535 U	535 U	514 U	510 U	605 U
Chromium	mg/kg	120000*	13.4 R	6.3 R	4.1 R	6.8 R	4.9 R	3	2.6
Chromium (Hexavalent Compounds)	mg/kg	240*	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.1 UJ	1.1	1.2
Cobalt	mg/kg	1600	1.6 J	0.42 J	0.21 J	0.96 J	0.5 J	0.36	0.059
Copper	mg/kg	3100	58.2	18.5	4.6	27.9	6.5	3.7	3 U
Cyanide	mg/kg	1600	1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.4 U	1.5 U
Iron	mg/kg	NL	15800 J	6630 J	4430 J	8320 J	6510 J	9140 J	3500 J
Lead	mg/kg	400	1020 J	63.9 J	4.2 J	1380 J	27.7 J	2.9 J	2.4 J
Magnesium	mg/kg	NL	537 U	526 U	535 U	535 U	514 U	510 U	605 U
Manganese	mg/kg	11000	89.8 J	8.3 J	4.7 J	33.6 J	13.9 J	33.4	2.9
Mercury	mg/kg	23	0.028 U	0.028 U	0.03 U	0.029 U	0.027 U	0.018 J	0.03 U
Nickel	mg/kg	1600	8.6	4.2 U	4.3 U	4.3 U	4.1 U	0.45 J	4.8 U
Potassium	mg/kg	NL	537 U	526 U	535 U	535 U	514 U	73.9 J	50.9 J
Selenium	mg/kg	390	0.76 J	0.15 J	0.059 J	0.18 J	0.12 J	0.15	0.12 U
Silver	mg/kg	390	1.1 U	1.1 U	1.1 U	1.1 U	1 U	1 U	1.2 U
Sodium	mg/kg	NL	537 U	526 U	535 U	535 U	514 U	510 U	605 U
Thallium	mg/kg	5	0.076 J	0.066 UJ	0.071 UJ	0.069 UJ	0.067 UJ	0.022	0.021
Vanadium	mg/kg	78	18.7 R	11.5 R	8.7 R	11.8 R	9.8 R	6.9	4.1
Zinc	mg/kg	23000	44.2	7.1	6.3 J	22.3	12.5	40.5	7.3 U
WET CHEMISTRY									
pH	su	NL		3.9					3.62
Solids, Percent	%	NL	85.9	85.7	83.5	81.8	88	91.1	81.7
Total Organic Carbon	mg/kg	NL		3301 J					1819 J

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TABLE 7  
Test Excavation Data Summary  
Soil Sample Results - Metals and Wet Chemistry  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T5TP1-SS1	T5TP1-SS2	T6TP1-SS1	T6TP1-SS2	T6TP2-SS1	T6TP2-SS2	T7TP1-SS1
CLP Number			B7Q23	B7Q24	B7Q31	B7Q32	MB7Q35	MB7Q36	B7Q43
Location			T5-Test Pit1-Sample1	T5-Test Pit1-Sample2	T6-Test Pit1-Sample1	T6-Test Pit1-Sample2	T6-Test Pit2-Sample1	T6-Test Pit2-Sample2	T7-Test Pit1-Sample1
Area			Area-01	Area-01	Area-01	Area-01	Area-04	Area-04	Area-01
Date			4/29/2010	4/29/2010	4/27/2010	4/27/2010	5/3/2010	5/3/2010	4/28/2010
Start Depth			0	6		4	1	4	0
End Depth			2	7		4.5	2	5	2
Depth Units			ft	ft		ft	ft	ft	ft
chemical_name	result_unit	RBS-NJRDCSRS-Soil							
METALS									
Aluminum	mg/kg	78000	2470	295	969	855	1280 J	514	725
Antimony	mg/kg	31	2.2 R	0.16 R	6.8 R	28.6 R	2.7 J	0.066	0.15 R
Arsenic	mg/kg	19	5 J	0.49 J	5.3 J	3.9 J	3.6	3.1	2.6 J
Barium	mg/kg	16000	31.3	2	11.1	10.5	7.5 J	2.4 J	2.3
Beryllium	mg/kg	16	0.2 J	0.058 J	0.073 J	0.081 J	0.56 U	0.52 U	0.045 J
Cadmium	mg/kg	78	0.17	0.023 U	0.12	0.28	0.061	0.026	0.021 U
Calcium	mg/kg	NL	729	532 U	538 U	590 U	560 U	517 U	500 U
Chromium	mg/kg	120000*	7.3	3.3	5.8	6.7	6.2	7.4	2.7
Chromium (Hexavalent Compounds)	mg/kg	240*	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ	1.1	1.1	1.1 UJ
Cobalt	mg/kg	1600	0.93 J	0.19 J	0.63 J	1.1 J	0.75	0.4	0.15 J
Copper	mg/kg	3100	28.1	1.6 J	17	11.7 J	7.9	3.3	2.5 UJ
Cyanide	mg/kg	1600	1.4 U	1.6 U	1.4 U	1.5 U	1.4 U	1.4 U	1.3 U
Iron	mg/kg	NL	9760	2210	7580	5470	8980 J	10300 J	17400
Lead	mg/kg	400	115 J	3.1 J	227 J	614 J	70 J	4.4 J	3.6 J
Magnesium	mg/kg	NL	546 U	532 U	538 U	590 U	560 U	517 U	500 U
Manganese	mg/kg	11000	34.8	4.4	21.6	15.6	16.8 J	7.9	5.1
Mercury	mg/kg	23	0.072	0.042	0.059	0.076	0.03	0.027 U	0.032
Nickel	mg/kg	1600	4.4 U	4.3 U	4.3 U	4.7 U	4.5 U	4.1 U	4 U
Potassium	mg/kg	NL	311 J	40.1 J	113 J	96.4 J	131 J	517 J	160 J
Selenium	mg/kg	390	0.32 J	0.038 J	0.25 J	0.26 J	0.14	0.1 U	0.045 J
Silver	mg/kg	390	0.18 J	1.1 U	1.1 U	1.2 U	1.1 U	1 U	0.15 J
Sodium	mg/kg	NL	546 U	532 U	538 U	590 U	560 U	517 U	500 U
Thallium	mg/kg	5	0.065 U	0.069 U	0.068	0.071 U	0.057	0.025	0.062 U
Vanadium	mg/kg	78	13.9	4.6	29	12.6	12	16	3.4
Zinc	mg/kg	23000	101	5.5 J	13	14	9.6	8.4	6.7
WET CHEMISTRY									
pH	SU	NL							
Solids, Percent	%	NL	93.1	79.8	87.3	89	89.3	90.3	94.6
Total Organic Carbon	mg/kg	NL							

"T" in Location Indicates Transect number

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Exceedances highlighted in blue.

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mg/kg - milligrams per kilogram

NL - not listed

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R - data is rejected due to exceeded quality control criteria

TABLE 7  
Test Excavation Data Summary  
Soil Sample Results - Metals and Wet Chemistry  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, NJ

Sample Identification			T7TP1-SS2	T8TP1-SS1	T8TP2-SS1	T8TP2-SS2	T8TP3-SS1	T8TP3-SS2	T9TP1-SS1	T9TP2-SS1	T9TP2-SS2
CLP Number			B7Q44	B7Q51	MB7Q55	MB7Q56	MB7Q59	MB7Q60	B7Q63	B7Q67	B7Q68
Location			T7-Test Pit1-Sample2	T8-Test Pit1-Sample1	T8-Test Pit2-Sample1	T8-Test Pit2-Sample2	T8-Test Pit3-Sample1	T8-Test Pit3-Sample2	T9-Test Pit1-Sample1	T9-Test Pit2-Sample1	T9-Test Pit2-Sample2
Area			Area-01	Area-01	Area-04	Area-04	Area-04	Area-04	Area-01	Area-04	Area-01
Date			4/28/2010	4/27/2010	5/4/2010	5/4/2010	5/4/2010	5/4/2010	4/27/2010	4/28/2010	4/28/2010
Start Depth			4	5	0	7	2	4	5	1	0
End Depth			5	6	2	9	2.5	4.5	5.5	2	1.25
Depth Units			ft	ft	ft	ft	ft	ft	ft	ft	ft
chemical_name	result_unit	RBS-NJRDCCSRs-Soil									
METALS											
Aluminum	mg/kg	78000	2370	1070	507	704	3530	3560	1520	4400	5470
Antimony	mg/kg	31	0.33 R	5.2 R	0.11	0.81	36.5	2.9	0.88 R	43.1 R	151 R
Arsenic	mg/kg	19	2 J	7.7 J	1.9	6.2	13.7	5	3.9 J	23.6 J	78 J
Barium	mg/kg	16000	10.1	11.8	10 J	24.8 J	40.6 J	35.8 J	23.6	52.9	138
Beryllium	mg/kg	16	0.39 J	0.12 J	0.51 U	0.54 U	0.58 U	0.46 U	0.14 J	0.33 J	0.44 J
Cadmium	mg/kg	78	0.086	0.33	0.046	0.03	0.097	0.14	0.26	1.8	5.5
Calcium	mg/kg	NL	527 U	625	510 U	542 U	576 U	459 U	1100	2170	6260
Chromium	mg/kg	120000*	5	3.4	4.5	9.8	12.6	10.8	6.9	7.8	66.3
Chromium (Hexavalent Compounds)	mg/kg	240*	1.1 UJ	1.1 UJ	1.1	1.1	1.1	1.1	1.2 UJ	1.1 UJ	1.1 UJ
Cobalt	mg/kg	1600	0.65 J	5.5 J	0.53	0.49	1	3.6	0.69 J	3.9 J	6.4 J
Copper	mg/kg	3100	16.4	17.8	3.8	10	8.8	11.4	5 J	159	188
Cyanide	mg/kg	1600	1.3 U	1.3 U	1.4 U	1.4 U	1.5 U	1.4 U	1.5 U	1.3 U	1.4 U
Iron	mg/kg	NL	22800 J	7420	8970 J	17000 J	13800 J	16600 J	19000	18300	23700
Lead	mg/kg	400	14.3 J	244 J	3.9 J	102 J	1000 J	61 J	70.7 J	1650 J	5080 J
Magnesium	mg/kg	NL	527 U	163 J	510 U	542 U	576 U	713	298 J	2490	3800
Manganese	mg/kg	11000	16.7	32.4	45.6	8.1	23.1	91.3	31.1	503	1140
Mercury	mg/kg	23	0.035	0.038	0.027 U	0.027 U	0.029 U	0.027 U	0.038	0.13	0.23 J
Nickel	mg/kg	1600	4.2 U	2.5 J	4.1 U	4.1 U	4.6 U	3.7 U	1.3 J	19.9	31.2
Potassium	mg/kg	NL	106 J	105 J	44.2 J	126 J	175 J	261 J	258 J	717	838
Selenium	mg/kg	390	0.14 J	0.17 J	0.045	0.13	0.32	0.11	0.19 J	0.17 J	0.43 J
Silver	mg/kg	390	0.19 J	0.13 J	1 U	1.1 U	1.2 U	0.92 U	0.2 J	0.29 J	0.61 J
Sodium	mg/kg	NL	527 U	478 U	510 U	542 U	576 U	459 U	556 U	529 U	577 U
Thallium	mg/kg	5	0.065 U	0.063 U	0.04	0.032	0.079	0.079	0.091	0.12	0.27 J
Vanadium	mg/kg	78	10.9	11.7	12.1	22.9	24.1	18.6	16	10.7	30
Zinc	mg/kg	23000	13.3	25.8	6.1 U	19.8	11.3	18.8	45.7	95.8	285
WET CHEMISTRY											
pH	su	NL								7.21	
Solids, Percent	%	NL	91	94	87.5	89.2	90.3	90.6	84.1	91.3	88.4
Total Organic Carbon	mg/kg	NL								4828 J	

"T" in Location indicates Transect number

CLP - Contract Laboratory Program

SU - Standard Units

Exceedances highlighted in blue.

RBS-NJRDCCSRs-Soil - NJDEP Residential Direct Contact Health Based

Criteria and Soil Remediation Standards. Revised November 4, 2009.

<http://www.state.nj.us/dep/srp/guidance/rs/>. Last accessed May 25, 2010

1 - NJDEP Residential Direct Contact Health Based Criteria and Soil Remediation Standards. Revised November 4, 2009.

<http://www.state.nj.us/dep/srp/guidance/rs/>. Last accessed May 25, 2010

\* - NJDEP Soil Cleanup Criteria (mg/kg), <http://www.nj.gov/dep/srp/guidance/scc/>.

Revised 12 May 1999. Last accessed June 25, 2010.

mg/kg - milligrams per kilogram

NL - not listed

U - non-detect

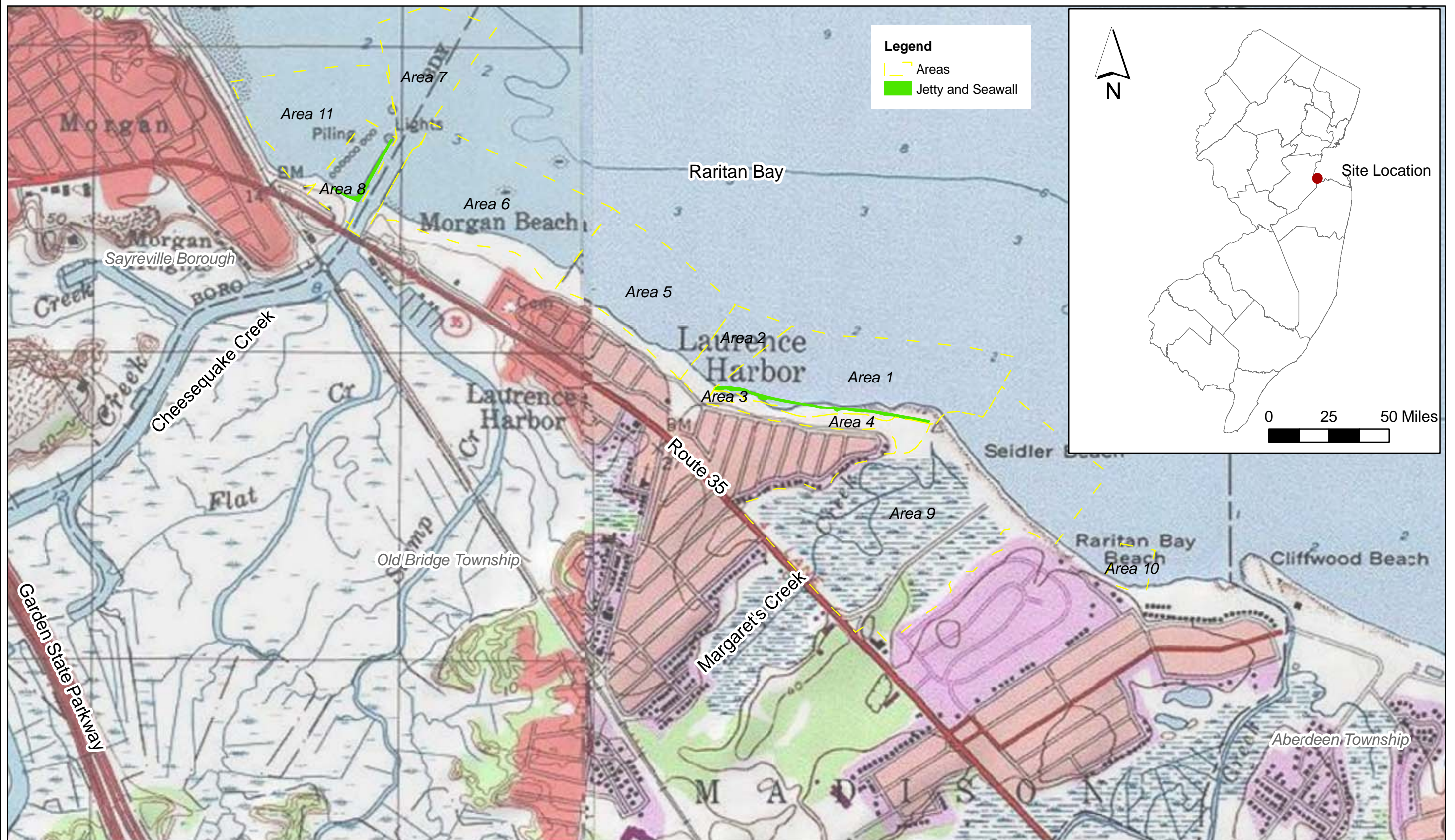
J - estimated data due to exceeded quality control criteria

R - data is rejected due to exceeded quality control criteria

CDM

Final Test Excavation Data Summary Report

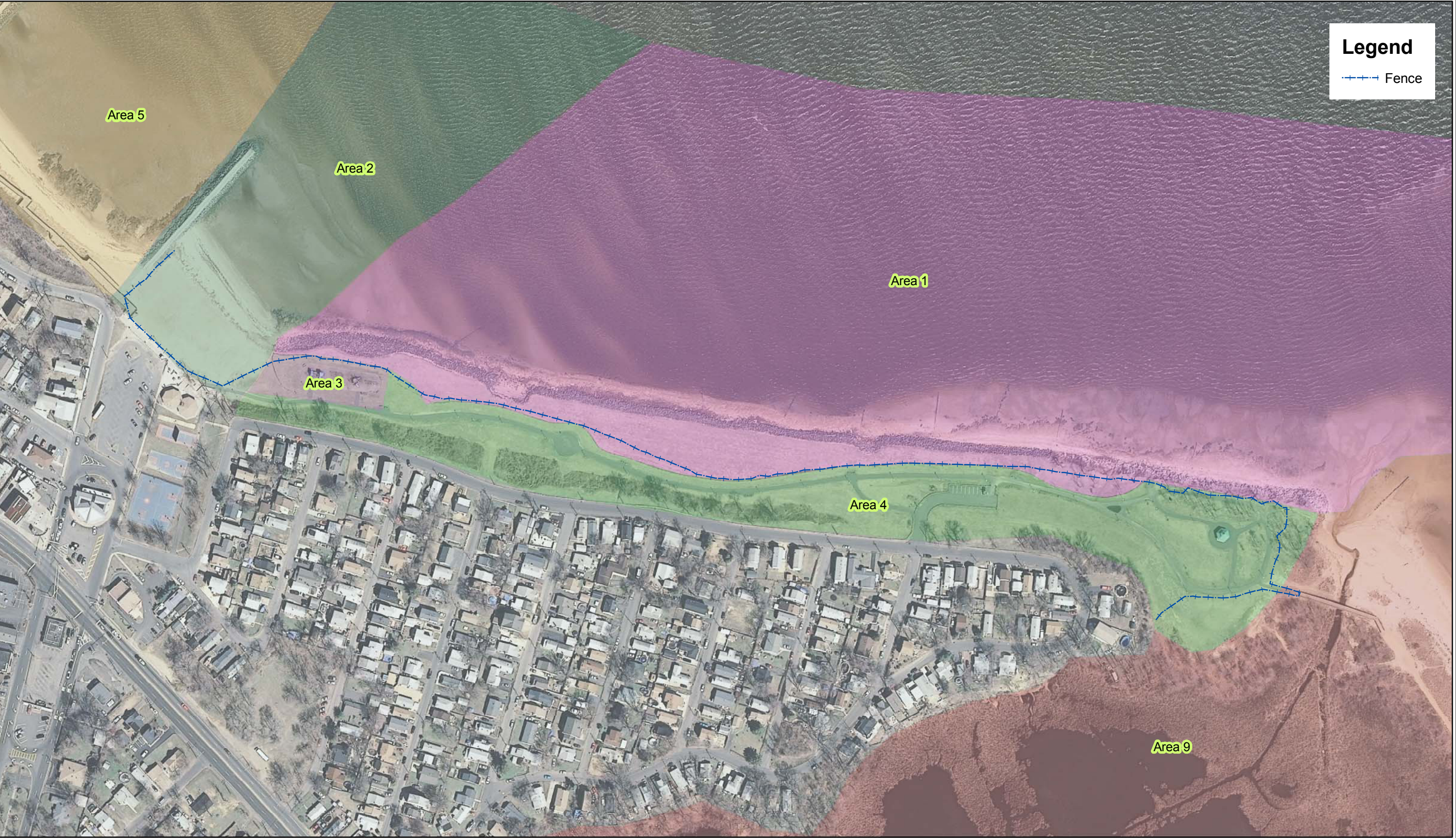
## FIGURES



**CDM**  
Source: USGS Topographic Quadrangle

0 500 1,000 2,000 3,000 Feet

Figure 1  
Site Map  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayerville, New Jersey



**Legend**

---+--- Fence

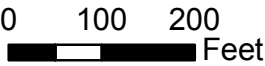
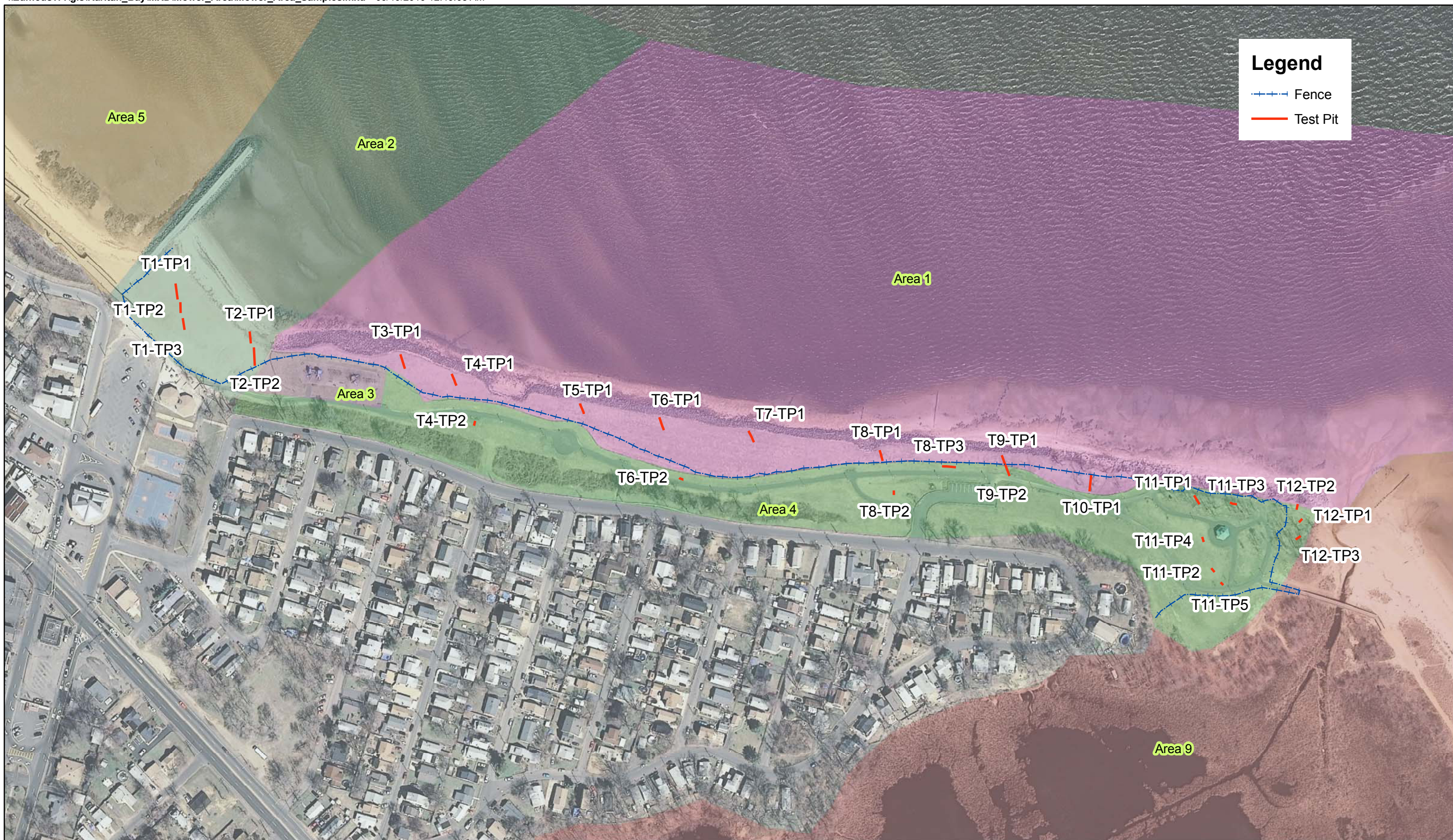


Figure 2  
Site Plan  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, New Jersey



**Legend**

---+--- Fence

--- Test Pit

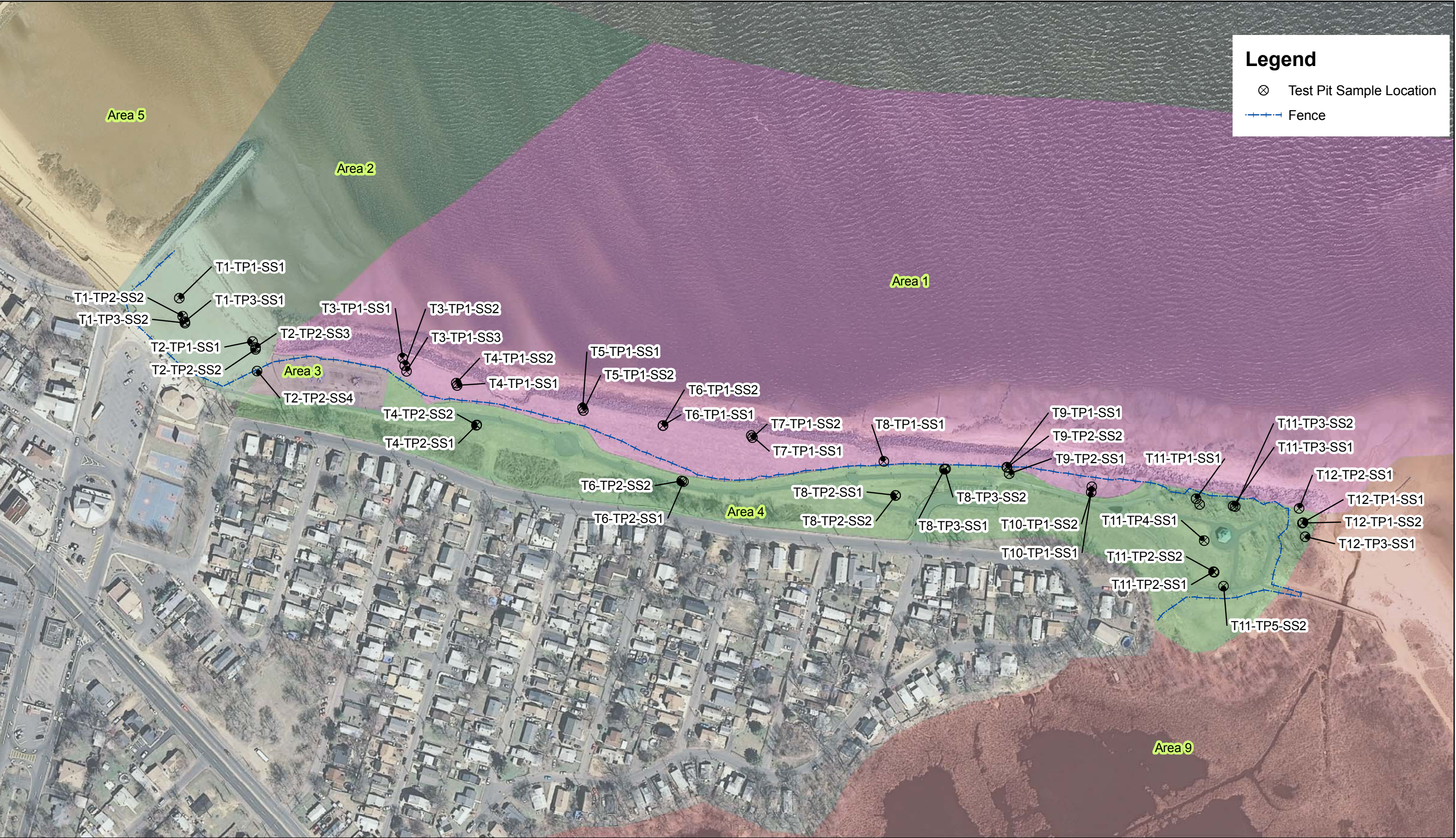
**CDM**

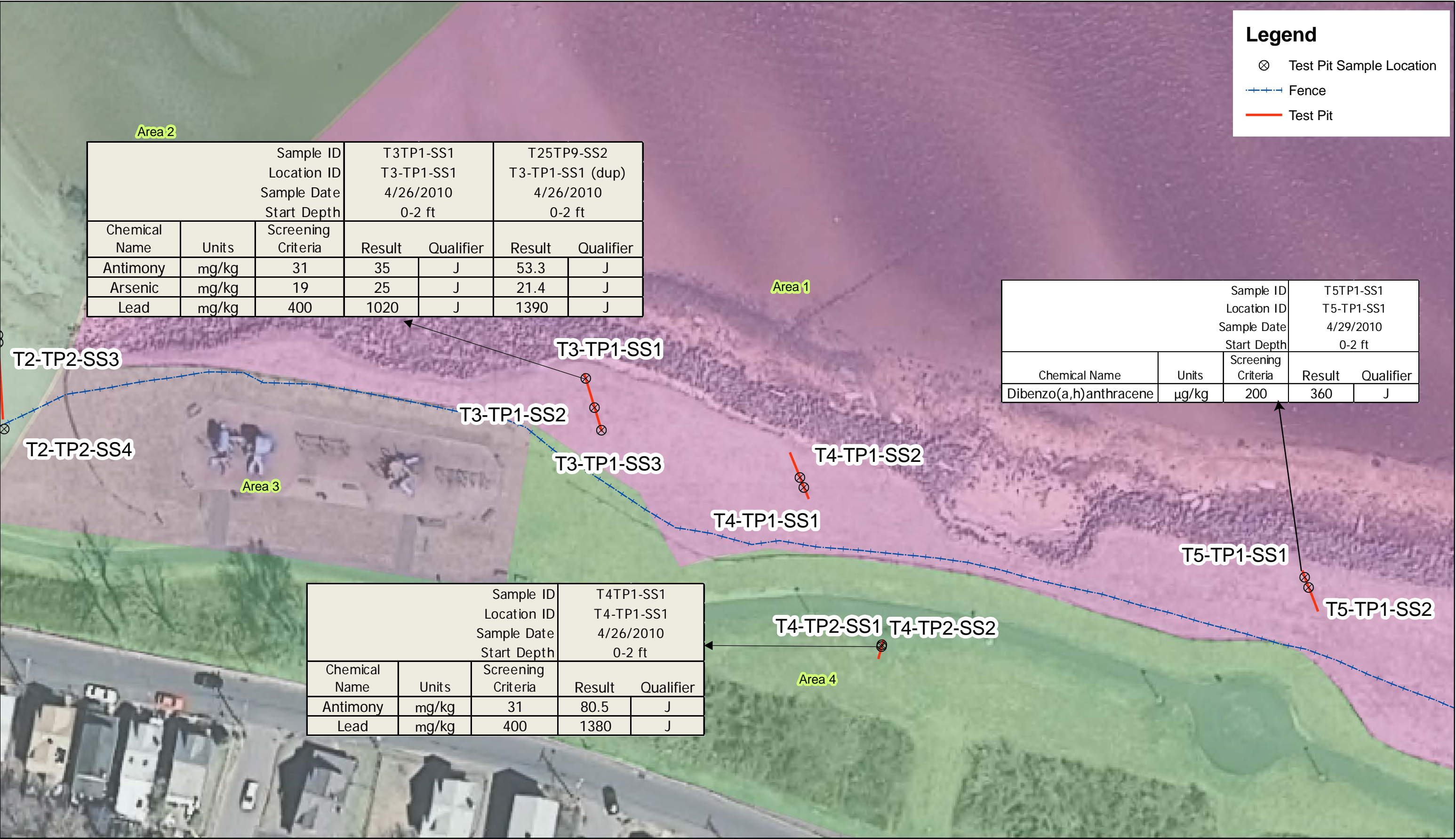
KEY  
T2-TP1 is Transect 2, test excavation 1

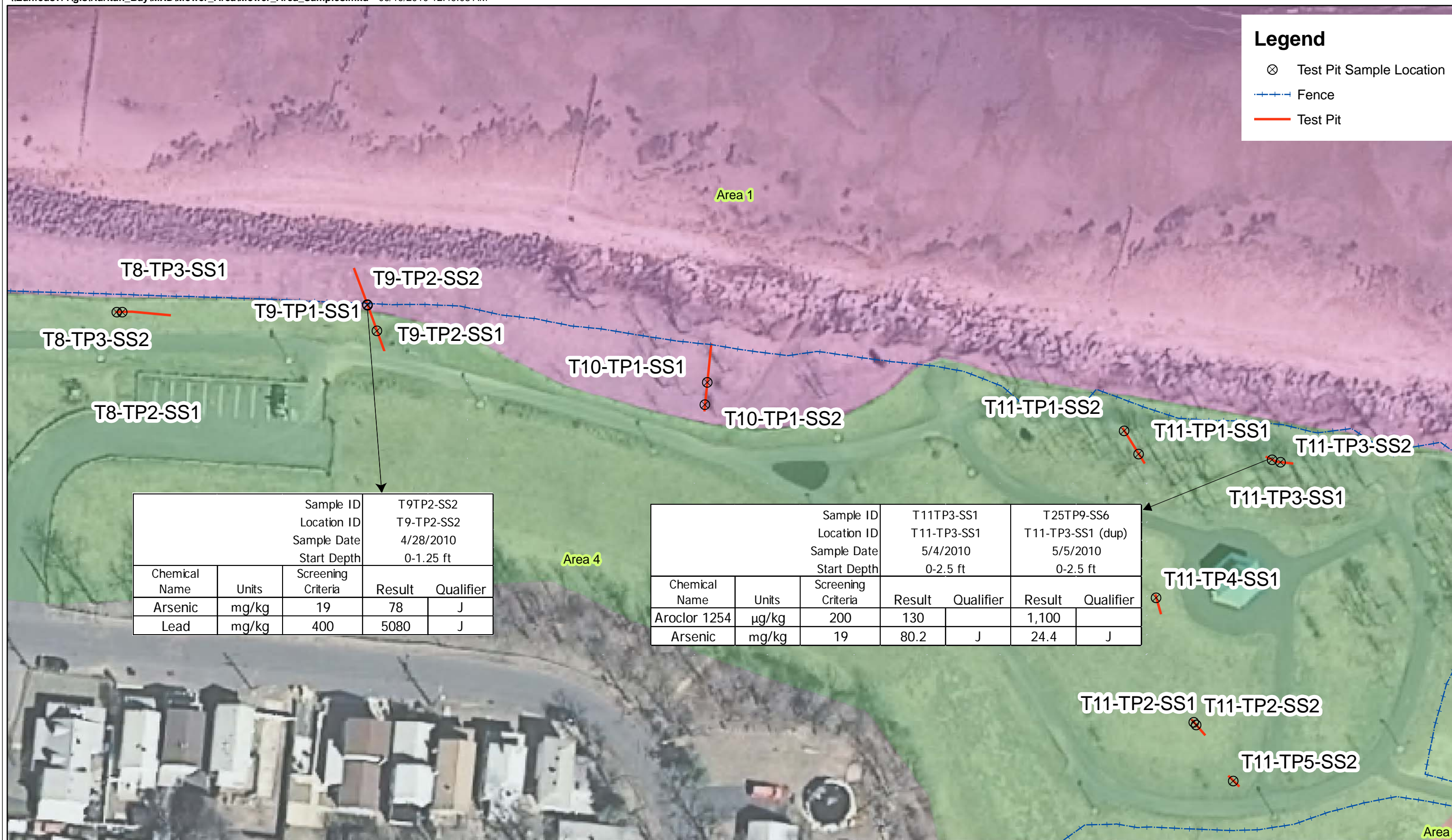
0 100 200  
Feet

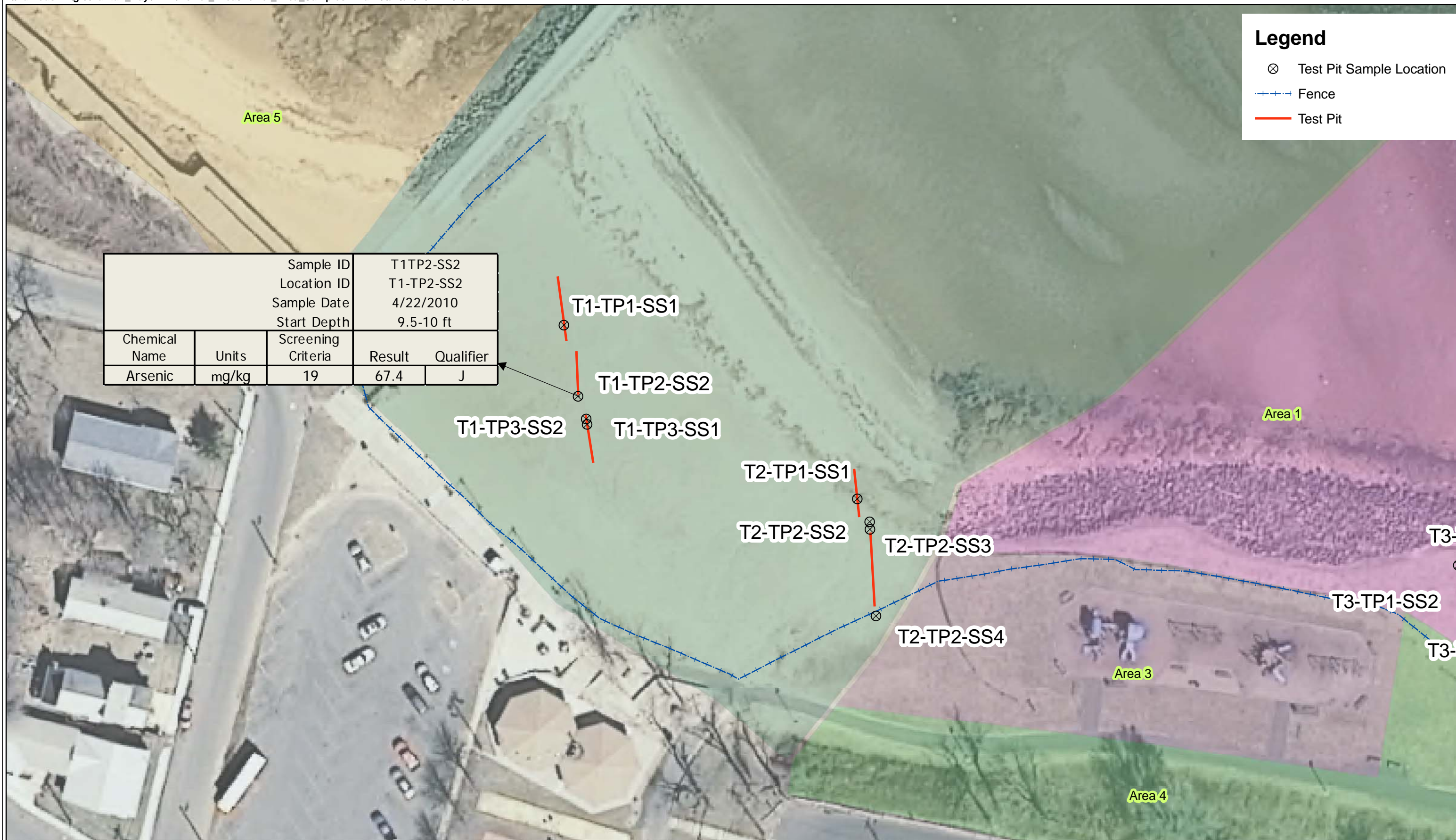


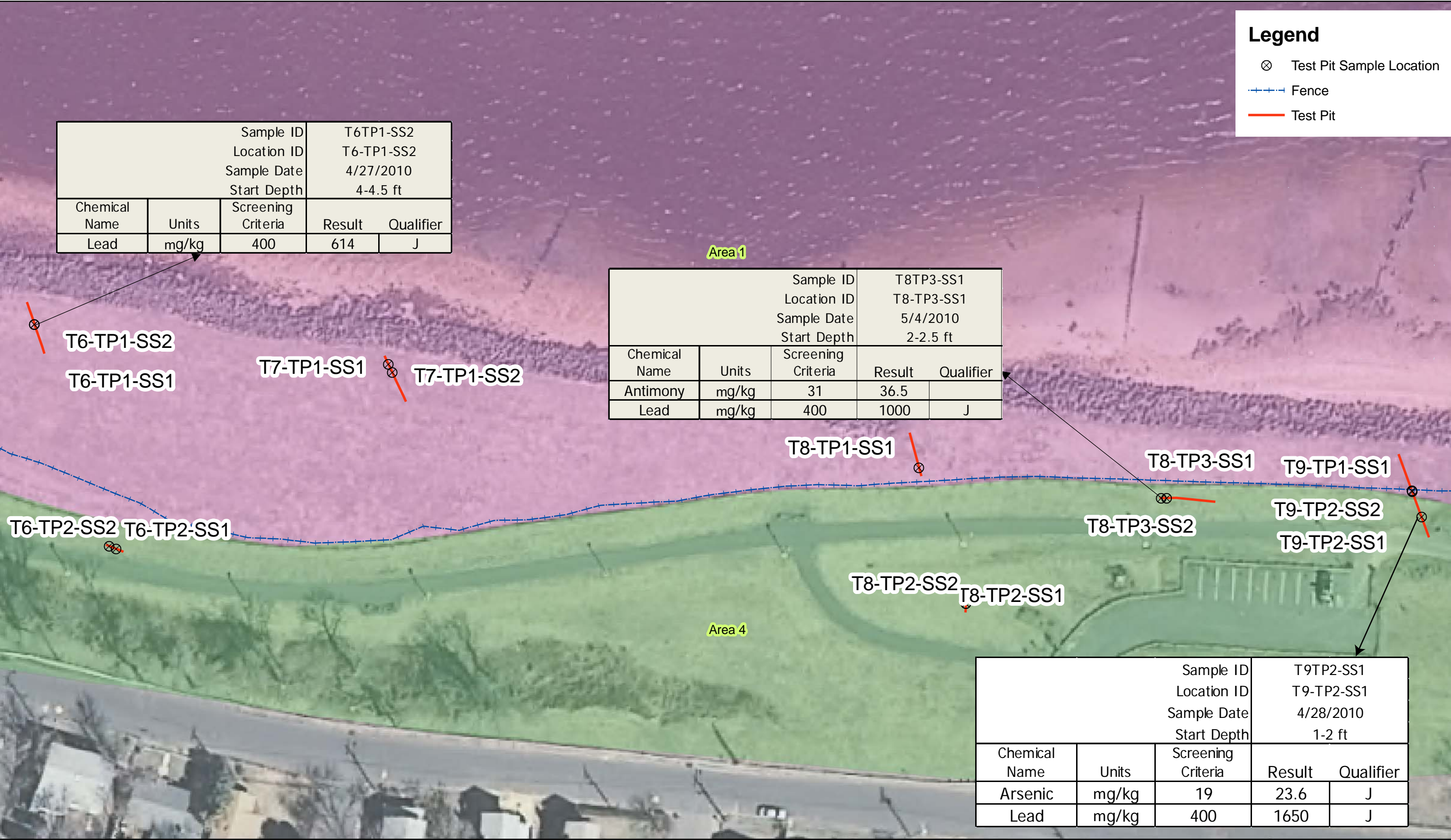
Figure 3  
Test Excavation Locations  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, New Jersey

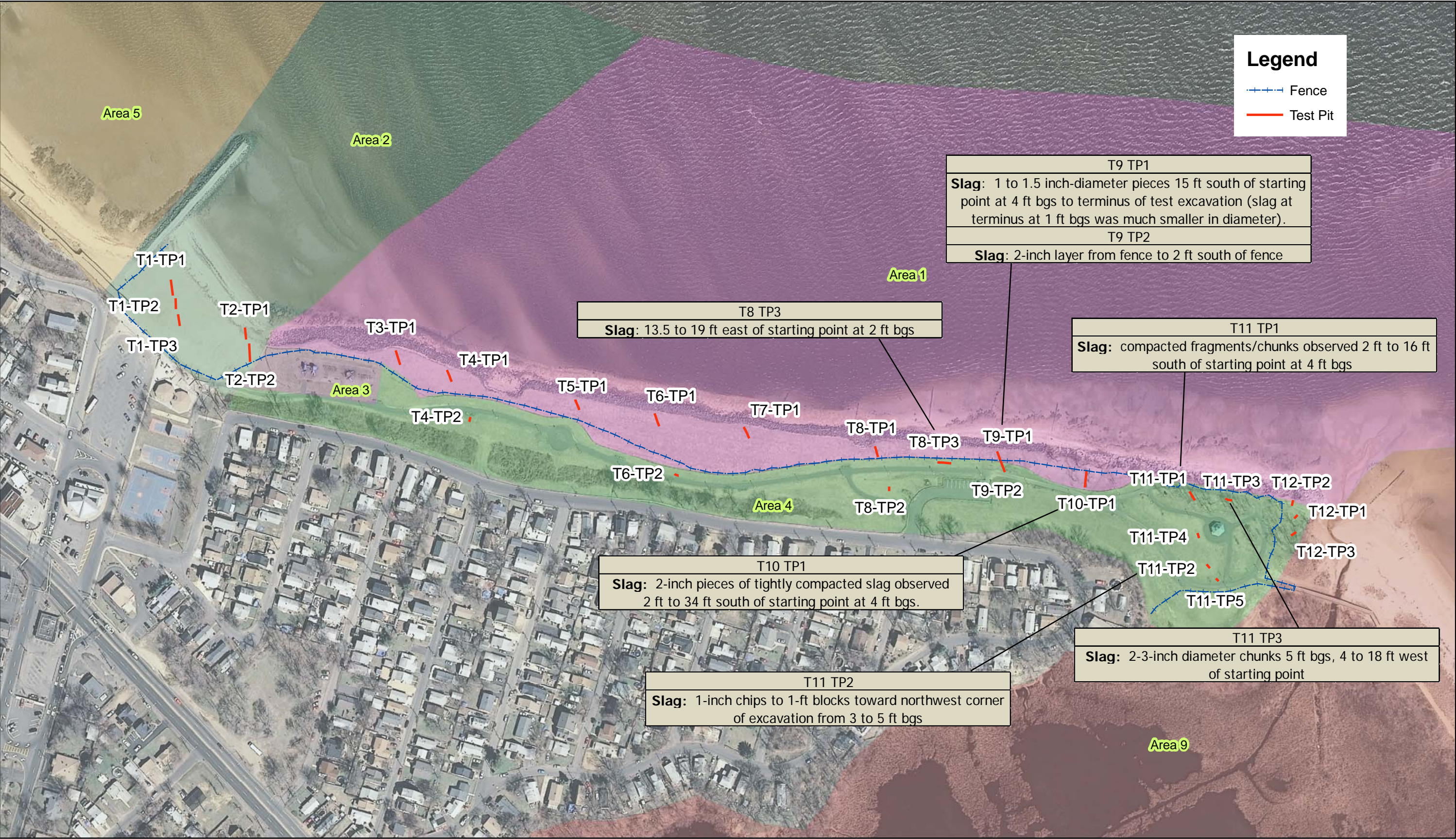












KEY  
T2-TP1 is Transect 2, test excavation 1

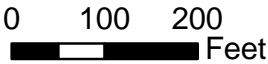


Figure 9  
Slag Distribution Map  
Raritan Bay Slag Superfund Site  
Old Bridge and Sayreville, New Jersey

**Attachment 1**

**Field Change Notices**

**RARITAN BAY SLAG SITE  
FIELD CHANGE REQUEST (FCR) FORM**

USACE Contract No.: W912DQ-08-D-0018

REQUEST NO: 1 DATE: 4/19/10

FCR TITLE: Particulate monitoring action level change

DESCRIPTION: The particulate monitoring action level has been revised from 1 mg/m<sup>3</sup> to 0.1 mg/m<sup>3</sup> because of the proximity to the residential community. Trenching and sampling activities will be suspended if the air concentrations of particulate matter exceed 0.1 mg/m<sup>3</sup> for more than 5 minutes.

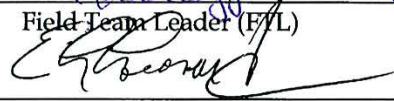
REASON FOR DEVIATION: Consultation with EPA and USACE determined the need for a more conservative approach to particulate monitoring.

RECOMMENDED MODIFICATION: The particulate matter action level will be changed from 1 mg/m<sup>3</sup> to 0.1 mg/m<sup>3</sup> in multiple places on Worksheet #17b, pages 53 and 54 of the final QAPP.

IMPACT ON PROJECT OBJECTIVES: none

Dated Signatures:

 4/19/10  
Field Team Leader (FTL)

 4/19/10  
CDM Task Order Manager (TOM)

Distribution:

EPA Remedial Project Manager  
CDM TOM  
Field Team

USACE PM  
Regional Quality Assurance Coordinator  
Project File

**RARITAN BAY SLAG SITE  
FIELD CHANGE REQUEST (FCR) FORM**

USACE Contract No.: W912DQ-08-D-0018

REQUEST NO: 2

DATE: 4/19/10

FCR TITLE: Addition of surface soil samples

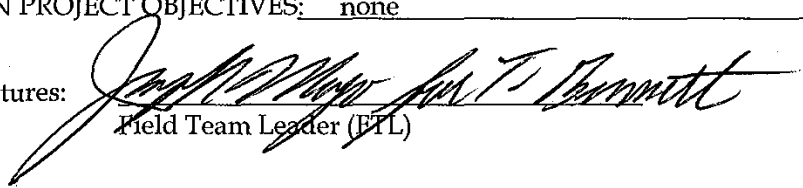
DESCRIPTION: The collection of surface soil samples will be added to the text of the Sample Collection Methods paragraph on Worksheet # 17b, page 52. The surface soil sample is considered to be one of the 4 samples planned for each test pit, so the total number of samples remains 120.

REASON FOR DEVIATION: Test excavations are schedule to occur in Site Areas 1, 2, and 4 in April 2010. Historical surface soil sampling in these areas is limited. Surface soil sampling is being added to the test excavation sampling to facilitate early collection of surface soils in the test excavation areas. Surface soil sample data will be used to supplement the existing surface soil data for use in the RI and human health and ecological risk assessments.

RECOMMENDED MODIFICATION: The paragraph will be amended as follows: "One surface soil sample will be collected from each of the 12 test excavation transects. Sample locations will be alternated between Area 1 and Area 4 to provide sample coverage for both of these areas. One surface soil sample will be collected in Area 2. The sample collection method will be as follows: At the beginning of each test excavation, a decontaminated backhoe bucket will remove soil to a depth of 2 feet. Soil samples will be collected from the sidewall of the excavation from the surface to a depth of 2 feet below the surface. Samples will be collected using a dedicated trowel. Sample collection procedures will be the same as those used to collect subsurface soil samples. Sample analyses will be the same as those for subsurface soil samples (QAPP Worksheet 18). Sample logging, screening (PID), handling, packaging, shipping, and documentations procedures will be the same as the procedures described in the QAPP for subsurface soil samples.

IMPACT ON PROJECT OBJECTIVES: none

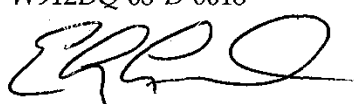
Dated Signatures:

  
Field Team Leader (FTL)

R2-0003897

**RARITAN BAY SLAG SITE  
FIELD CHANGE REQUEST (FCR) FORM**

USACE Contract No.: W912DQ-08-D-0018

 4/20/10  
\_\_\_\_\_  
CDM Task Order Manager (TOM)

Distribution:

EPA Remedial Project Manager  
CDM TOM  
Field Team

USACE PM  
Regional Quality Assurance Coordinator  
Project File

**Attachment 2**

**Test Excavation Logs**



CDM  
125 Maiden Lane, 5th Floor  
New York, NY 10038  
Telephone: 212-785-9123  
Fax: 212-785-6114

# TEST PIT NUMBER TP-T1-TP-1

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 4/22/10 COMPLETED 4/22/10

GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE 25' L x 2' W x 9' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

▽ AT TIME OF EXCAVATION 8.00 ft

LOGGED BY Tonya Bennett CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 50's mild, cool

AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
			Test Pit Length: 25 feet Test Pit Width: 2 feet Test Pit Depth: 9 feet	SW		(SW) Light brownish tan fine to medium SAND, medium gravel, broken angular granite fragments, broken red brick fragments, 2-3 whole cinderblocks, wood fragments, moist
2.5				SW		(SW) Light brownish tan medium SAND, trace silt, (wood piling observed at 2.5' bgs at 2' south of starting point)
				SW-SM		(SW-SM) Light brown to dark brownish gray fine to medium SAND, very moist with some gray silt, moist
				CL		(CL) Dark gray CLAY with fine to medium sand striations, moist
5.0				CL		(CL) Dark gray silty CLAY with trace fine to medium sand striations
				CL		(CL) Dark gray silty CLAY with trace fine to medium sand striations, wet at 8.25' bgs
7.5						
	GRAB 1	100	T1-TP1-SS1 (27 feet south of starting point)			
						Bottom of test pit at 9.0 feet.

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

R2-0003900



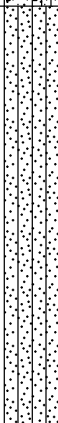




CDM  
125 Maiden Lane, 5th Floor  
New York, NY 10038  
Telephone: 212-785-9123  
Fax: 212-785-6114

# TEST PIT NUMBER TP-T1-TP-2

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers PROJECT NAME Raritan Bay Slag Superfund Site  
PROJECT NUMBER 74541-6402 PROJECT LOCATION Old Bridge, New Jersey  
DATE STARTED 4/22/10 COMPLETED 4/22/10 GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE 27' L x 2' W x 10' D  
EXCAVATION CONTRACTOR CEMCO GROUND WATER LEVELS:  
EXCAVATION METHOD Backhoe ☒ AT TIME OF EXCAVATION 10.00 ft  
LOGGED BY Tonya Bennett CHECKED BY John Dougherty AT END OF EXCAVATION ---  
NOTES 50's mild, cool AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
			Test Pit Length: 27 feet Test Pit Width: 2 feet Test Pit Depth: 9 feet	SW		CLAYEY GRAVEL, (SW) Light brownish tan fine to medium SAND, medium gravel, broken angular granite fragments, broken red brick fragments, dry
2.5				SW-SM		(SW-SM) Brownish gray fine to medium SAND with gray silt, moist
5.0				SM		(SM) Dark gray silty SAND, some fine to medium SAND striations and some very dark gray to black organic material striations with the consistency of dried, broken asphalt
7.5				SM		(SM) Dark gray silty SAND, trace darker gray clay banding, very moist
10.0	GRAB 1	100	T1-TP2-SS2			

10.0 ▽

Bottom of test pit at 10.0 feet.

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

R2-0003901



CDM  
125 Maiden Lane, 5th Floor  
New York, NY 10038  
Telephone: 212-785-9123  
Fax: 212-785-6114

# TEST PIT NUMBER TP-T1-TP-3

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 4/22/10 COMPLETED 4/22/10

GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE 30' L x 2' W x 10' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

∇ AT TIME OF EXCAVATION 10.00 ft

LOGGED BY Tonya Bennett CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 50's mild, cool

AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
	GRAB 1	100	T1-TP3-SS1 Test Pit Length: 30 feet Test Pit Width: 2 feet Test Pit Depth: 10 feet	SW		(SW) Light brown to tan fine to medium SAND, brick fragments and fine to medium gravel, dry
2.5				SW		(SW) Light brownish tan fine to medium sand, fine to medium gravel angular granite fragments, trace gray silt, dry (Large concrete chunks encountered at 5.5' bgs depth)
5.0				SM		(SM) Dark gray silty SAND, fine to medium gravel, moist to very moist (large concrete chunks at 8' bgs and 10' south of starting point)
7.5				SM		(SM) Dark gray silty SAND to sandy CLAY, moist to wet
10.0	GRAB 2	100	T1-TP3-SS2, Duplicate T25-TP9-SS1			Bottom of test pit at 10.0 feet.

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

R2-0003902



CDM  
125 Maiden Lane, 5th Floor  
New York, NY 10038  
Telephone: 212-785-9123  
Fax: 212-785-6114

## TEST PIT NUMBER TP-T2-TP-1

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 4/21/10 COMPLETED 4/21/10

GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE 20' L x 2' W x 5 D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

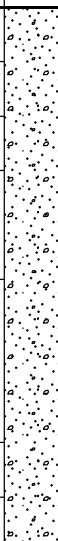
▽ AT TIME OF EXCAVATION 5.00 ft

LOGGED BY Tonya Bennett CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 60's sunny, cool

AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
			Test Pit Length: 20 feet Test Pit Width: 2 feet Test Pit Depth: 5 feet	SW		0.5 (SW) Light to dark brown medium to coarse SAND with medium gravel, trace broken asphalt fragments, moist
				SW		1.0 (SW) Light to dark brown medium to coarse SAND with fine gravel, moist
				SW		1.5 (SW) Light to dark brown medium to coarse SAND with fine gravel, moist
				SW		2.5 (SW) Light to dark brown medium to coarse SAND with medium gravel, trace red brick fragments, moist
2.5				SW		2.5 (SW) Dark brownish gray medium SAND , some sand covered clay clumps, trace medium gravel, moist
				SW		4.0 (SW) Light grayish brown medium SAND, medium gravel, some broken concrete fragments
	GRAB 1	100	T2-TP1-SS1	SW		4.5 (SW) Light brown medium SAND with medium gravel and wood fragments
5.0				SW		5.0 ▽

Bottom of test pit at 5.0 feet.

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

R2-0003903



CDM  
125 Maiden Lane, 5th Floor  
New York, NY 10038  
Telephone: 212-785-9123  
Fax: 212-785-6114

# TEST PIT NUMBER TP-T2-TP-2

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 4/21/10 COMPLETED 4/21/10

GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE 35.5' L x 2' W x 9.3' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

▽ AT TIME OF EXCAVATION 9.30 ft

LOGGED BY Tonya Bennett CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 60's sunny, cool

AFTER EXCAVATION ---

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
				OL		0.2 (OL) Top soil, grass, roots
	GRAB 1	100	T2-TP2-SS4 Test Pit Length: 35.5 feet Test Pit Width: 2 feet Test Pit Depth: 9.3 feet	SW		(SW) Light brown fine to medium SAND with fine to medium gravel, broken concrete and brick fragments
2.5				SW		2.0 (SW) Light brownish gray fine to medium SAND with fine to medium gravel, concrete fragments, some sandy silty clumps, moist
				SW		3.0 (SW) Light grayish brown fine to medium SAND with fine to medium gravel, moist
				SW		4.0 (SW) Light grayish brown fine to medium SAND with fine to medium gravel, moist
5.0				SW		5.0 (SW-SC) Light brown fine to medium SAND with medium gravel and dark gray clay clump, moist
	GRAB 2	100	T2-TP2-SS3	SW-SC		
7.5						
	GRAB 3	100	T2-TP2-SS2	SW-SC		
						8.0 (SW-SC) Light grayish brown SAND, dark gray clumps of clay, trace gravel, wet at 9.3' bgs
						9.3 ▽

Bottom of test pit at 9.3 feet.

R2-0003904



CDM  
125 Maiden Lane, 5th Floor  
New York, NY 10038  
Telephone: 212-785-9123  
Fax: 212-785-6114

# TEST PIT NUMBER TP-T3-TP-1

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 4/26/10 COMPLETED 4/26/10

GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE 36' L x 2' W x 9' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

▽ AT TIME OF EXCAVATION 9.00 ft

LOGGED BY Tonya Bennett CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 50's mild, cool

AFTER EXCAVATION ---

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
				OL		(OL) Top soil, grass, roots
	GRAB 1	100	T3-TP1-SS1, Duplicate T25-TP9-SS2 Test Pit Length: 36 feet Test Pit Width: 2 feet Test Pit Depth: 9 feet			0.5 (SW) Light brownish tan fine to medium SAND, fine to medium gravel, brick and concrete fragments, dry
2.5				SW		
	GRAB 2	100	T3-TP1-SS2			
5.0						
				SW		6.0 (SW) Tan fine to medium SAND, fine to medium cobbles with light gray fine to medium silty SAND, moist
7.5						
	GRAB 3	100	T3-TP1-SS3			8.0 (SW-SC) Light gray silty SAND with gray clay banding, moist
				SW- SC		
						9.0 ▽

Bottom of test pit at 9.0 feet.

R2-0003905



CDM  
125 Maiden Lane, 5th Floor  
New York, NY 10038  
Telephone: 212-785-9123  
Fax: 212-785-6114

# TEST PIT NUMBER TP-T4-TP-1

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 4/26/10 COMPLETED 4/26/10

GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE 30' L x 2' W x 10' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

▽ AT TIME OF EXCAVATION 10.00 ft

LOGGED BY Tonya Bennett CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 50's mild, cool

AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
	GRAB 1	100	T4-TP1-SS1 Test Pit Length: 30 feet Test Pit Width: 2 feet Test Pit Depth: 10 feet	OL		0.3 (OL) Top soil, grass, roots (SW) Light gray to dark brown fine to medium SAND, medium cobbles and brick fragments, dry
2.5				SW		
						4.0
5.0				SW- SC		(SW-SC) Light brown fine to medium SAND with gray clay banding, trace silt, moist
7.5						
	GRAB 2	100	T4-TP1-SS2			
10.0						10.0 ▽

Bottom of test pit at 10.0 feet.

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

R2-0003906



CDM  
125 Maiden Lane, 5th Floor  
New York, NY 10038  
Telephone: 212-785-9123  
Fax: 212-785-6114

## TEST PIT NUMBER TP-T4-TP-2

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 5/3/10 COMPLETED 5/3/10

GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE 5' L x 2' W x 10' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

▽ AT TIME OF EXCAVATION 10.00 ft

LOGGED BY Tonya Bennett CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 70s rainy, humid

AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
				OL		0.3 (OL) Topsoil
	GRAB 1	100	T4-TP2-SS1 Test Pit Length: 5 feet Test Pit Width: 2 feet Test Pit Depth: 10 feet	SM		(SM) Dark brown fine to medium silty SAND, fine to medium gravel, slightly moist to moist
2.5						
5.0						
	GRAB 2	100	T4-TP2-SS2	SM		5.0 (SM) Dark brown fine to medium silty SAND with dark gray silty sand banding throughout, moist to wet
7.5						
10.0						10.0 ▽

Bottom of test pit at 10.0 feet.

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

R2-0003907



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# TEST PIT NUMBER TP-T5-TP-1

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 4/29/10 COMPLETED 4/29/10

GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE 25' L x 2' W x 10' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

▽ AT TIME OF EXCAVATION 10.00 ft

LOGGED BY Tonya Bennett CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 50's mild, cool

AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
				OL		0.2 (OL) Top soil, grass, roots
	GRAB 1	100	T5-TP1-SS1 Test Pit Length: 25 feet Test Pit Width: 2 feet Test Pit Depth: 10 feet			(SW) Dark brown fine to medium SAND, trace silt, some fine to medium gravel, dry to moist
2.5				SW		
5.0						
	GRAB 2	100	T5-TP1-SS2			
7.5						
				SW		8.0 (SW) Dark brown fine to medium SAND, trace silt, some fine to medium gravel, dark gray sandy clay banding, wet
10.0						10.0 ▽

Bottom of test pit at 10.0 feet.

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

R2-0003908



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# TEST PIT NUMBER TP-T6-TP-1

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 4/27/10

COMPLETED 4/27/10

GROUND ELEVATION TEST PIT SIZE 30' L x 2' W x 10' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

▽ AT TIME OF EXCAVATION 10.00 ft

LOGGED BY Tonya Bennett

CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 50's mild, cool

AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
2.5	GRAB 1	100	T6-TP1-SS1 Test Pit Length: 30 feet Test Pit Width: 2 feet Test Pit Depth: 10 feet	SW		(SW) Light brown fine to medium SAND, fine to medium gravel, brick fragments, dry to moist
5.0	GRAB 2	100	T6-TP1-SS2	SW		(SW) Light brown fine to medium SAND, fine to medium gravel, brick fragments, dry to moist
7.5				SW		
10.0						Bottom of test pit at 10.0 feet.

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

R2-0003909



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## TEST PIT NUMBER TP-T6-TP-2

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 5/3/10 COMPLETED 5/3/10

GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE 20' L x 2' W x 10' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

▽ AT TIME OF EXCAVATION 10.00 ft

LOGGED BY Tonya Bennett CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 70s rainy, humid

AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
				OL		0.3 (OL) Topsoil
						(SM) Dark brown fine to medium silty SAND, fine to medium gravel, moist to slightly moist
	GRAB 1	100	T6-TP2-SS1, Duplicate T25-TP9-SS5			
2.5			Test Pit Length: 20 feet Test Pit Width: 2 feet Test Pit Depth: 10 feet	SM		
	GRAB 2	100	T6-TP2-SS2			
5.0						5.0 (SM) Dark brown fine to medium silty SAND, fine to medium gravel, moist to wet
				SM		
7.5						
10.0						10.0 ▽

Bottom of test pit at 10.0 feet.

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

R2-0003910



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# TEST PIT NUMBER TP-T7-TP-1

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 4/28/10 COMPLETED 4/28/10

GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE 20' L x 2' W x 10' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

▽ AT TIME OF EXCAVATION 10.00 ft

LOGGED BY Tonya Bennett CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 50's mild, cool

AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
				OL		0.3 (OL) Top soil, grass, roots
	G GRAB 1	100	T7-TP1-SS1 Test Pit Length: 20 feet Test Pit Width: 2 feet Test Pit Depth: 10 feet	SW-SC		(SW-SC) Reddish brown clayey SAND, brick fragments, dry
2.5				SM		1.5 (SM) Light brown to dark brown fine to medium silty SAND with fine to medium gravel, moist
	G GRAB 2	100	T7-TP1-SS2			
5.0				SM		5.0 (SM) Light brown to dark brown fine to medium silty SAND with fine to medium gravel with light gray clay and silty sand banding, moist to wet
7.5				SM		
10.0						10.0 ▽ Bottom of test pit at 10.0 feet.

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

R2-0003911



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# TEST PIT NUMBER TP-T8-TP-1

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 4/27/10 COMPLETED 4/27/10

GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE 22' L x 2' W x 8' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

▽ AT TIME OF EXCAVATION 8.00 ft

LOGGED BY Tonya Bennett CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 50's mild, cool

AFTER EXCAVATION ---

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
			Test Pit Length: 22 feet Test Pit Width: 2 feet Test Pit Depth: 8 feet	SW		(SW) Light brown fine to medium SAND, fine to medium gravel, brick and concrete fragments, dry to moist
2.5				SW		(SW) Light brown fine to medium SAND, fine to medium gravel, brick and concrete fragments, dry to moist
5.0	GRAB 1	100	T8-TP1-SS1			
7.5				SW		(SW) Light brown fine to medium SAND with light gray silty sand, trace to some red brick fragments, moist
8.0						Bottom of test pit at 8.0 feet.

R2-0003912



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# TEST PIT NUMBER TP-T8-TP-2

PAGE 1 OF 1

**CLIENT** U. S. Army Corps of Engineers **PROJECT NAME** Raritan Bay Slag Superfund Site  
**PROJECT NUMBER** 74541-6402 **PROJECT LOCATION** Old Bridge, New Jersey  
**DATE STARTED** 5/4/10 **COMPLETED** 5/4/10 **GROUND ELEVATION** \_\_\_\_\_ **TEST PIT SIZE** 20' L x 2'W x 12' D  
**EXCAVATION CONTRACTOR** CEMCO **GROUND WATER LEVELS:**  
**EXCAVATION METHOD** Backhoe  $\nabla$  **AT TIME OF EXCAVATION** 11.80 ft  
**LOGGED BY** Tonya Bennett **CHECKED BY** John Dougherty **AT END OF EXCAVATION** ---  
**NOTES** 60s sunny, cool **AFTER EXCAVATION** ---

GENERAL BH / TP / WELL RARITAN BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
	G1 GRAB 1	100	T8-TP2-SS1  Test Pit Length: 20 feet Test Pit Width: 2 feet Test Pit Depth: 12 feet	SM		(SM) Topsoil and dark brown silty SAND, trace very fine gravel, moist
				SM		(SM) Brown to light orange/brown silty SAND moist
				SW		(SW) Light orangish brown to tan very fine to fine SAND, moist
2.5				ML		(ML) Dark gray to black clayey SILT, moist
				SM		(SM) Brown to light brown silty SAND, moist
5.0	G1 GRAB 2	100	T8-TP2-SS2	SW		(SW) Yellow to tan very fine to medium SAND, moist, trace fine to medium gravel
				SW		(SW) Light gray very fine to fine SAND, moist
7.5				SW		(SW) Dark gray very fine to fine SAND, moist, trace medium gravel
				SW		(SW) Trace brown very fine to medium SAND, moist, trace gravel
10.0				SW		
						$\nabla$ 12.0

Bottom of test pit at 12.0 feet.

R2-0003913



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# TEST PIT NUMBER TP-T8-TP-3

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 5/4/10 COMPLETED 5/4/10

GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE 21' L x 2' W x 7' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

AT TIME OF EXCAVATION --- test pit terminated above water table

LOGGED BY Tonya Bennett CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 60s sunny, cool

AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
			Test Pit Length: 21 feet Test Pit Width: 2 feet Test Pit Depth: 7 feet	OL		0.3 (OL) Topsoil and dark brown silty SAND, moist
				SW		(SW) Light brown and tan very fine to fine SAND, moist, trace fine gravel
						1.8
				SW		(SW) Brown to gray brown very fine SAND, trace silt, moist, trace fine gravel
2.5	GRAB 1	100	T8-TP3-SS1	SW		2.3 (SW) SLAG (13.5 to 19 feet east of starting point at 2 feet bgs)
				CL		(CL) Black silty CLAY, moist
						3.5
						(SW) Orangish brown/tan very fine to medium SAND, trace silt, moist, trace fine to medium gravel
	GRAB 2	100	T8-TP3-SS2	SW		
5.0						
						7.0

Bottom of test pit at 7.0 feet.

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

R2-0003914





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# TEST PIT NUMBER TP-T9-TP-2

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 4/28/10 COMPLETED 4/28/10

GROUND ELEVATION TEST PIT SIZE 20' L x 2' W x 10' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

▽ AT TIME OF EXCAVATION 10.00 ft

LOGGED BY Tonya Bennett CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 50's mild, cool

AFTER EXCAVATION ---

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
				OL		0.2 (OL) Top soil, grass, roots
	GRAB 2	100	T9-TP2-SS2			(CL) Reddish brown sandy CLAY, moist, SLAG (2-inch layer from fence to 2' south of fence)
	GRAB 1	100	T9-TP2-SS1	CL		
2.5			Test Pit Length: 20 feet Test Pit Width: 2 feet Test Pit Depth: 10 feet	CL		2.0 (CL) Reddish brown sandy CLAY with fine to medium brown SAND, moist
5.0				SW		4.0 (SW) Light brown fine to medium SAND, trace silt, fine to medium gravel, moist
7.5				SM		8.0 (SM) Light brown to light gray silty SAND, moist to wet
10.0						10.0 ▽ Bottom of test pit at 10.0 feet.

R2-0003916



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# TEST PIT NUMBER TP-T10-TP-1

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 4/30/10 COMPLETED 4/30/10

GROUND ELEVATION TEST PIT SIZE 43' L x 2' W x 10' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

▽ AT TIME OF EXCAVATION 10.00 ft

LOGGED BY Tonya Bennett CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 50's mild, cool

AFTER EXCAVATION ---

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
	GRAB 1	100	T10-TP1-SS1, Duplicate T25-TP1-SS4	OL		0.3 (OL) Top soil, grass, roots (SM) Dark brown fine to medium silty SAND, fine to medium gravel, moist
				SM		
2.5			Test Pit Length: 43 feet Test Pit Width: 2 feet Test Pit Depth: 10 feet	SM		2.0 (SM) Dark brown fine to medium silty SAND, fine to medium gravel, moist. SLAG (2-inch pieces of tightly compacted slag observed 2 ft to 34 ft south of starting point at 4 ft bgs).
	GRAB 2	100	T10-TP1-SS2	SW		4.0 (SW) Dark brown fine to medium SAND, trace silt and fine to medium gravel, moist
5.0				SW		
				SW		6.0 (SW) Dark brown fine to medium SAND, trace silt and fine to medium gravel with dark gray bands of sandy clay, moist
7.5				SW		
				SW		8.0 (SW) Dark brown fine to medium SAND, trace silt and fine to medium gravel with dark gray bands of sandy clay, moist
10.0						10.0 ▽

Bottom of test pit at 10.0 feet.

R2-0003917



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# TEST PIT NUMBER TP-T11-TP-1

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 4/29/10 COMPLETED 4/29/10

GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE 20' L x 2' W x 10' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

▽ AT TIME OF EXCAVATION 10.00 ft

LOGGED BY Tonya Bennett CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 50's mild, cool

AFTER EXCAVATION ---

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
	GRAB 1	100	T11-TP1-SS1 Test Pit Length: 20 feet Test Pit Width: 2 feet Test Pit Depth: 10 feet	SW		(SW) Top soil, grass, roots, dark brown fine to medium SAND, dry
2.5				SW		(SW) Dark brown fine to medium SAND, trace silt, fine to medium gravel, dry to moist
5.0				SW		(SW) Dark brown fine to medium SAND, trace silt, dry. SLAG (4" to 6" diameter compacted fragments and chunks observed 2 ft to 16 ft south of starting point at 4 ft bgs)
	GRAB 2	100	T11-TP1-SS2			
7.5				SW		(SW) Dark brown fine to medium SAND, trace silt. SLAG was not observed after 16' south of starting point, moist to wet
10.0						Bottom of test pit at 10.0 feet.

R2-0003918



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# TEST PIT NUMBER TP-T11-TP-2

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 5/4/10

COMPLETED 5/4/10

GROUND ELEVATION

TEST PIT SIZE 20'L x 2' W X 10' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

▽ AT TIME OF EXCAVATION 10.00 ft

LOGGED BY Tonya Bennett

CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 60s sunny, cool

AFTER EXCAVATION ---

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
	GRAB 1	100	T11-TP2-SS1 Test Pit Length: 20 feet Test Pit Width: 2 feet Test Pit Depth: 10 feet	OL		(OL) Topsoil
				SW		(SW) Brown to tan silty SAND, trace fine to medium gravel
2.5				SW		(SW) Orange tan very fine to medium SAND
				SM		(SM) Gray to brown silty SAND, SLAG (1-inch chips to 1-foot blocks toward northwest corner of excavation from 3 to 5 ft bgs)
5.0	GRAB 2	100	T11-TP2-SS2	CL		(CL) Gray to black silty CLAY
7.5				SW		(SW) Light gray very fine SAND
10.0						Bottom of test pit at 10.0 feet.

R2-0003919



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# TEST PIT NUMBER TP-T11-TP-3

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 5/5/10

COMPLETED 5/5/10

GROUND ELEVATION TEST PIT SIZE 28' L x 2' W x 6' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

AT TIME OF EXCAVATION --- test pit terminated above water table

LOGGED BY Tonya Bennett

CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 60s sunny, cool

AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
	GRAB 1	100	T11-TP3-SS1, Duplicate T25-TP9-SS6 Test Pit Length: 28 feet Test Pit Width: 2 feet Test Pit Depth: 6 feet	OL		(OL) Topsoil, roots
				SW		0.7 (SW) Dark brown fine to medium SAND, fine to medium gravel, dry
2.5				SW		2.0 (SW) SAA, moist
				SW		4.0 (SW) SAA with SLAG (2 to 3-inch diameter chunks 5 feet bgs and 4 to 18 feet west of starting point)
5.0				SW		
	GRAB 2	100	T11-TP3-SS2			6.0

Bottom of test pit at 6.0 feet.

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

R2-0003920



## PAGE 1 OF 1

**CLIENT** U. S. Army Corps of Engineers

**PROJECT NAME** Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

**PROJECT LOCATION** Old Bridge, New Jersey

**DATE STARTED** 5/15/10 **COMPLETED** 5/15/10

**GROUND ELEVATION**                      **TEST PIT SIZE** 5' L x 2' W x 7' D

EXCAVATION CONTRACTOR CEMCO

**GROUND WATER LEVELS:**

EXCAVATION METHOD Backhoe

**AT TIME OF EXCAVATION** --- test pit terminated above water table

**LOGGED BY** Tonya Bennett      **CHECKED BY** John Dougherty

AT END OF EXCAVATION ---

**NOTES** 60s sunny, cool

**AFTER EXCAVATION** ---

GENERAL BH / TP / WELL RARITAN BAY TEST PIT LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

Bottom of test pit at 7.0 feet.

R2-0003921





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# TEST PIT NUMBER TP-T12-TP-1

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 4/23/10 COMPLETED 4/23/10

GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE 12' L x 2' W x 10' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

▽ AT TIME OF EXCAVATION 10.00 ft

LOGGED BY Tonya Bennett CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 50's mild, cool

AFTER EXCAVATION ---

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
	GRAB 1	100	T12-TP1-SS1 Test Pit Length: 12 feet Test Pit Width: 2 feet Test Pit Depth: 10 feet	OL		0.2 (OL) Top soil, grass, roots (SW) Light brown fine to medium SAND with some silt, some brick fragments, broken concrete fragments, dry
2.5				SW		
				SM		2.0 (SM) Light brownish red fine to medium silty SAND, moist
5.0				SM		4.0 (SM) Light brownish red fine to medium silty SAND with black clay banding, moist
7.5				SM		6.0 (SM) Light brownish red to light gray fine to medium silty SAND with fine to medium SAND, moist
10.0	GRAB 2	100	T12-TP1-SS2	SW		8.0 (SW) Light gray medium SAND with some silty and fine to medium gravel, moist
						10.0 ▽

Bottom of test pit at 10.0 feet.

R2-0003923



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# TEST PIT NUMBER TP-T12-TP-2

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 4/23/10 COMPLETED 4/23/10

GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE 16' L x 2' W x 10' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

▽ AT TIME OF EXCAVATION 10.00 ft

LOGGED BY Tonya Bennett CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 50's mild, cool

AFTER EXCAVATION ---

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
			Test Pit Length: 16 feet Test Pit Width: 2 feet Test Pit Depth: 10 feet	OL		(OL) Top soil, grass, roots
				SW		(SW) Light brown fine to medium SAND, broken brick fragments, dry
2.5				SW		(SW) Light brown fine to medium SAND, trace silt, moist
				SM		(SM) Light brown fine to medium silty SAND with light gray medium silty SAND, moist
5.0				SM		(SM) Light brownish red fine to medium silty SAND with dark gray to light gray fine silty SAND striations, moist (Concrete chunks observed at 7' bgs at 2' west of starting point)
7.5	GRAB 1	100	T12-TP2-SS1	SM		
				SW		(SW) Light gray medium SAND with some silty and fine gravel, moist to wet
10.0						10.0 ▽

Bottom of test pit at 10.0 feet.

R2-0003924



CDM  
125 Maiden Lane, 5th Floor  
New York, NY 10038  
Telephone: 212-785-9123  
Fax: 212-785-6114

# TEST PIT NUMBER TP-T12-TP-3

PAGE 1 OF 1

CLIENT U. S. Army Corps of Engineers

PROJECT NAME Raritan Bay Slag Superfund Site

PROJECT NUMBER 74541-6402

PROJECT LOCATION Old Bridge, New Jersey

DATE STARTED 4/23/10 COMPLETED 4/23/10

GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE 29' L x 2' W x 10' D

EXCAVATION CONTRACTOR CEMCO

GROUND WATER LEVELS:

EXCAVATION METHOD Backhoe

▽ AT TIME OF EXCAVATION 10.00 ft

LOGGED BY Tonya Bennett CHECKED BY John Dougherty

AT END OF EXCAVATION ---

NOTES 50's mild, cool

AFTER EXCAVATION ---

GENERAL BH / TP / WELL RARITAN\_BAY\_TEST\_PIT\_LOGS.GPJ GINT STD US.GDT 7/8/10 REV.

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						
			Test Pit Length: 29 feet Test Pit Width: 2 feet Test Pit Depth: 10 feet	OL		0.3 (OL) Top soil, grass, roots
				SW		(SW) Light brown fine to medium SAND, brick fragments, some gravel, dry
2.5				SW		2.0 (SW) Light brown fine to medium SAND with some silt, dry to moist, live tree roots observed from a nearby tree
				SM		4.0 (SM) Light brownish red fine to medium silty SAND with some light gray medium silty sand, moist
5.0				SM		6.0 (SM) Light gray and brownish red silty SAND, trace fine gravel, moist to very moist
7.5	GRAB 1	100	T12-TP3-SS1	SM		8.0 (SM) Brownish red silty SAND with fine to medium gravel and light gray fine to medium sand, moist
10.0						10.0 ▽

Bottom of test pit at 10.0 feet.

R2-0003925

**Attachment 3**

**Non-Hazardous Bills of Lading**

**MIDDLESEX COUNTY UTILITIES AUTHORITY**

Solid Waste Division  
Administrative Office - 53 Edgeboro Road  
East Brunswick, NJ 08816  
(732) 246-4313 Fax (732) 246-8846

**MIDDLESEX COUNTY LANDFILL****FACILITY I.D. NO. 1204A****INVOICE / RECEIPT DOCUMENT NUMBER  
92614009****CUSTOMER COPY**

Bill To:  
CEMC085822  
CEMCO INC  
PO BOX 212

Hauler:  
CEMC085822  
CEMCO INC  
PO BOX 212

HAINESPORT NJ 08036

HAINESPORT NJ 08036

Date	Entry Time	Operator	Exit Time	Operator	Gross Weight	Tare Weight	Net Weight
05/06/2010	13:43	RGM	14:16	RGM	( 37220 LB)	( 36260 LB)	( 960 LB)
00511488	Scale 05		Scale 05		Scale 05	Scale 05	
Vehicle No	Type	Plate	Transaction Type				
04269	Rolloff	AG358K	CK-5090				
C21269	Open 20						
				Normal			
Quantity	WC	Description/Origin			Units	Unt Price	Amount
0.4800	10B	HOUSEHOLD/MUNICIPAL REGULAR FEE MIDDLESEX COUNTY OLD BRIDGE TWP (MADISON TWP)			TONS		
					100.00%		
NEW TK, WT. → 71060							

I agree to deliver solid waste for disposal in accordance with current Middlesex County Utilities Authority landfill policies and procedures. I hereby certify that the information provided on this form is true to the best of my knowledge.

**Total**

DRIVER NAME:

PRINT:

SIGNATURE:

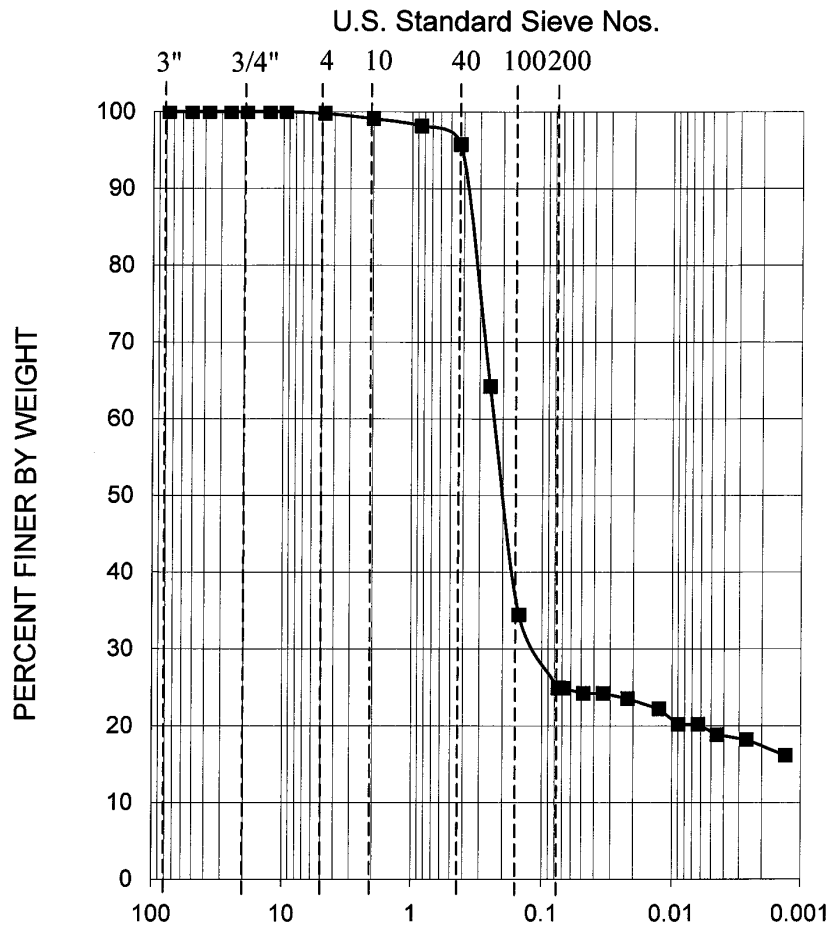
**R2-0003927**

<b>NON-HAZARDOUS WASTE MANIFEST</b>	1. Generator ID Number <b>NA</b>	2. Page 1 of <b>1</b>	3. Emergency Response Phone <b>609-261-3848</b>	4. Waste Tracking Number <b>2257</b>	
	5. Generator's Name and Mailing Address <b>USEPA Region 2 290 Broadway New York, NY 10007 (212)637-4410</b>				
Generator's Site Address (if different than mailing address) <b>Old Bridge Waterfront Park Raritan Bay Slag Superfund Site Old Bridge Township, NJ</b>					
6. Transporter 1 Company Name <b>CEMCO-Custom Environmental Management Co Inc</b>				U.S. EPA ID Number	
7. Transporter 2 Company Name				U.S. EPA ID Number	
8. Designated Facility Name and Site Address <b>Middlesex County Utilities Authority 53 Edgeboro Road East Brunswick, NJ 08816 Facility's Phone: (732) 246-4313</b>				U.S. EPA ID Number	
9. Waste Shipping Name and Description		10. Containers		11. Total Quantity	12. Unit Wt./Vol.
		No.	Type		
1. Non RCRA/Non DOT Regulated Waste Solid (ID-10)		001	CM	20	P
2.					
3.					
4.					
13. Special Handling Instructions and Additional Information					
14. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.					
Generator's/Officer's Printed/Typed Name <b>Ed Kulikovsky</b>			Signature <i>[Signature]</i>	Month <b>5</b>	Day <b>6</b>
15. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S.			Port of entry/exit: Date leaving U.S.:		
16. Transporter Acknowledgment of Receipt of Materials					
Transporter 1 Printed/Typed Name <b>CEMCO RAY Grover</b>			Signature <i>[Signature]</i>	Month <b>05</b>	Day <b>06</b>
Transporter 2 Printed/Typed Name <b>CEMCO</b>			Signature	Month	Day
17. Discrepancy					
17a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection					
Manifest Reference Number:					
17b. Alternate Facility (or Generator)				U.S. EPA ID Number	
Facility's Phone:					
17c. Signature of Alternate Facility (or Generator)				Month	Day
18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a					
Printed/Typed Name			Signature	Month	Day

**Attachment 4**

**Grain Size Distribution Curves**

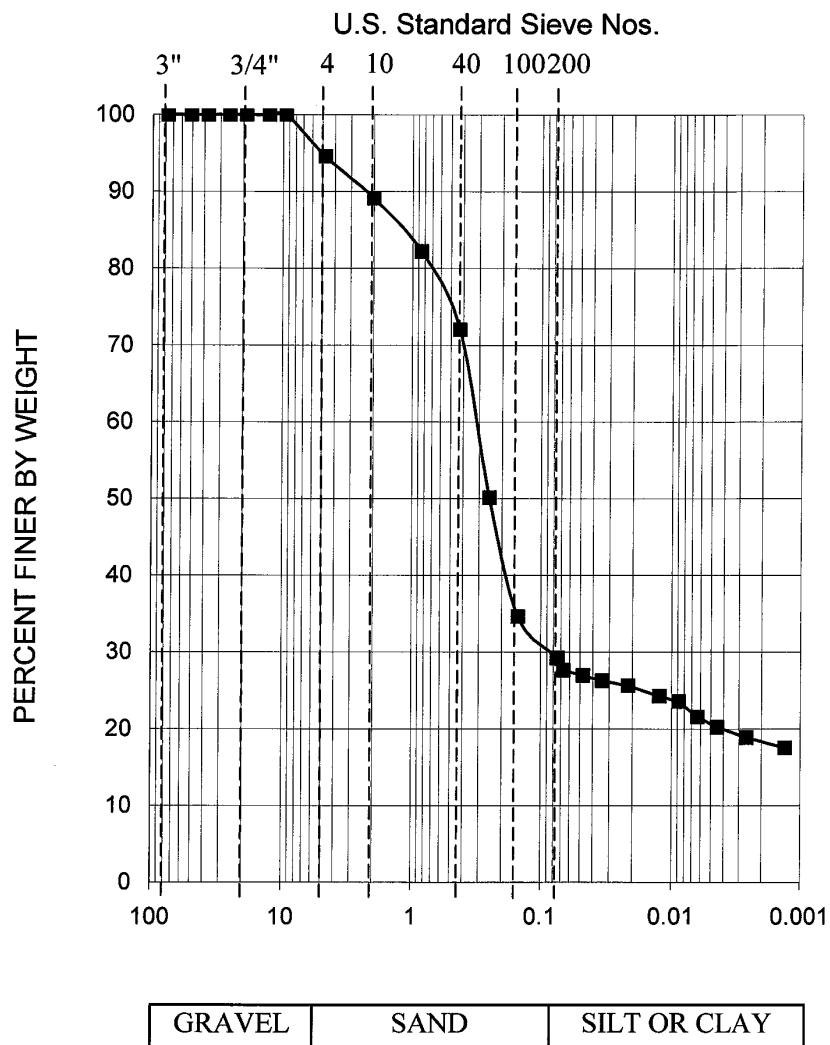
Sample tested in accordance with ASTM C136 and or D421/D422




GRAVEL	SAND	SILT OR CLAY
--------	------	--------------

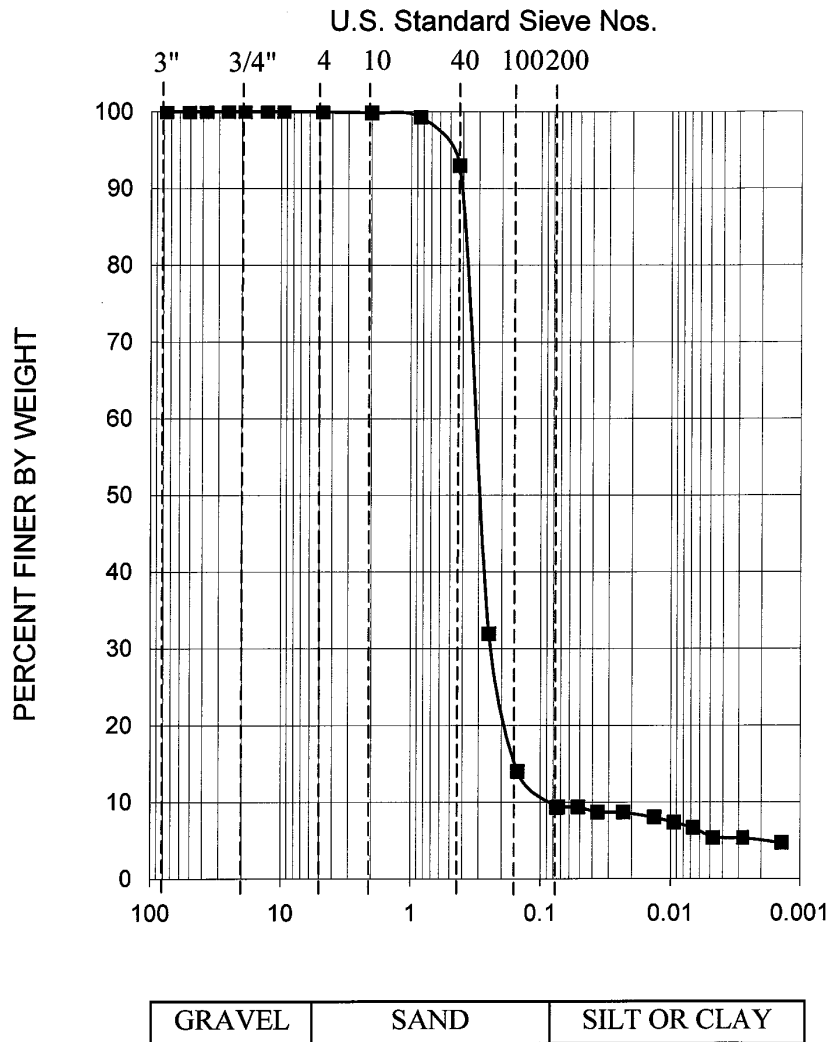
<b>Boring No.</b>		<b>Sample Description</b>	<b>Class</b>	<b>LL</b>	<b>PI</b>	 <b>Schnabel</b> ENGINEERING
<b>Sample No.</b>	T11-TP1-SS2					
<b>Depth (ft)</b>						
<b>Sample Distribution</b>			<b>Sample Source</b>			<b>GRADATION CURVE</b>
Sand: 75.1% Silt: 6.1% Clay: 18.8%						
<b>% Passing No. 200</b>		<b>Natural Moisture Content (%)</b>		<b>Project:</b> Shealy Laboratory LD27010		
				<b>Contract No.</b> 9190043.28		

Sample tested in accordance with ASTM C136 and or D421/D422



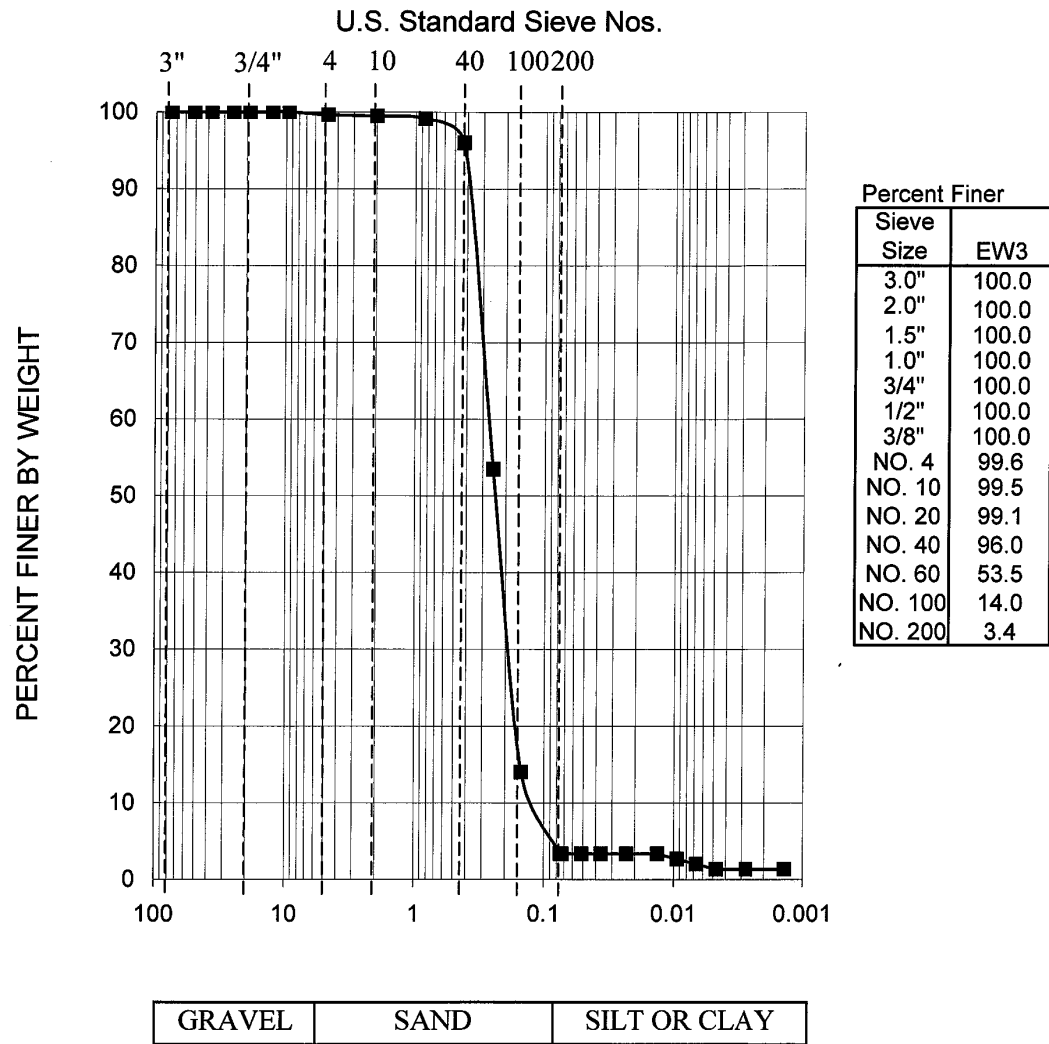
Boring No.		Sample Description	Class	LL	PI	 <b>Schnabel</b> ENGINEERING
Sample No.	T9-TP2-SS1					
Depth (ft)						
Sample Distribution		Sample Source			GRADATION CURVE	
Sand: 70.8 % Silt: 8.3% Clay: 20.9%						
% Passing No. 200	29.2	Natural Moisture Content (%)				Project:  Shealy Laboratory LD27010
						Contract No. 9190043.29


Sample tested in accordance with ASTM C136 and or D421/D422



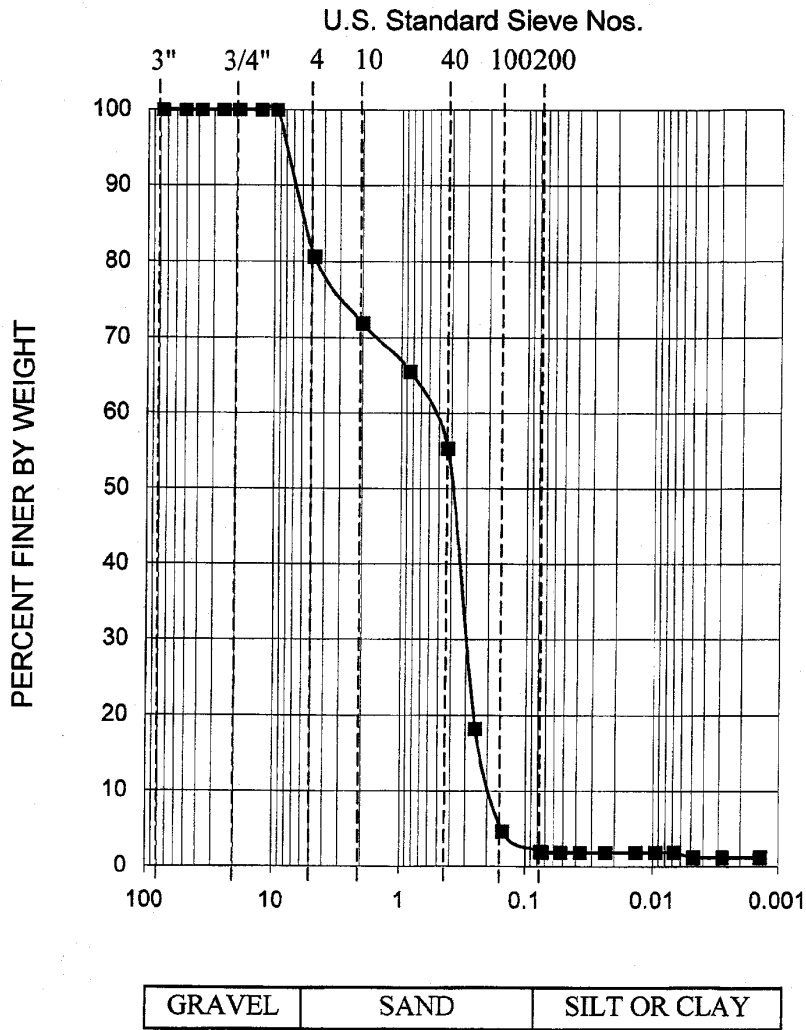
<b>Boring No.</b>		<b>Sample Description</b>	<b>Class</b>	<b>LL</b>	<b>PI</b>	 <b>Schnabel</b> ENGINEERING
<b>Sample No.</b>	T11-TP4-SS1					
<b>Depth (ft)</b>						
<b>Sample Distribution</b>		<b>Sample Source</b>				<b>GRADATION CURVE</b>
Sand: 90.7% Silt: 4.0% Clay: 5.3%						
<b>% Passing No. 200</b>	9.3	<b>Natural Moisture Content (%)</b>				<b>Project:</b> Shealy Laboratory LE06030
						<b>Contract No.</b> 9190043.30

Sample tested in accordance with ASTM C136 and or D421/D422



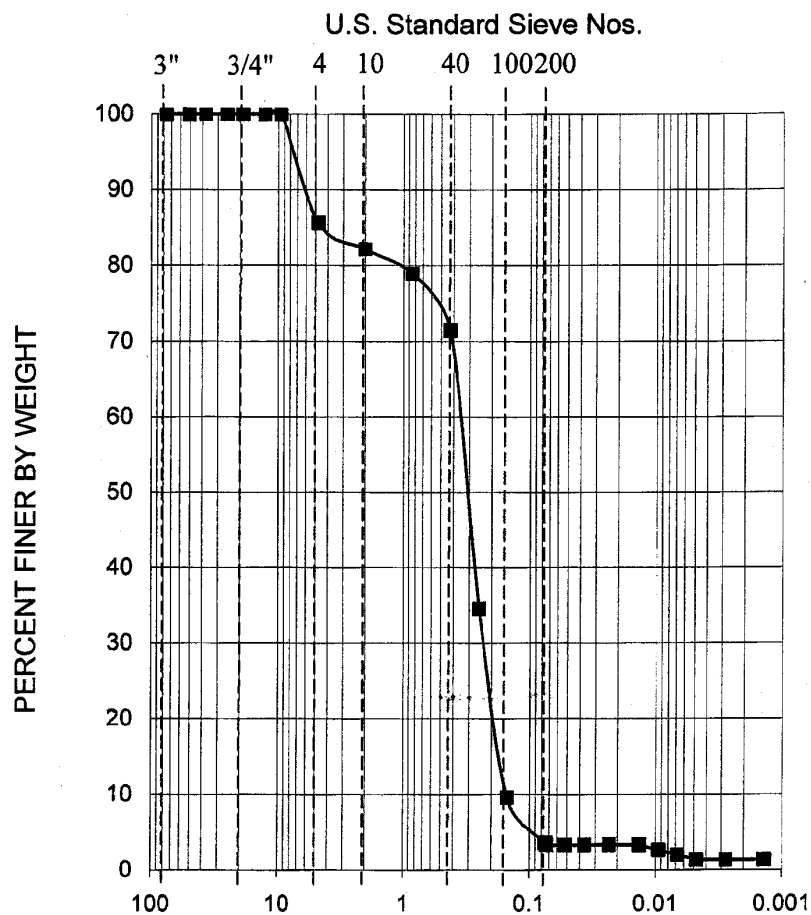
Boring No.		Sample Description	Class	LL	PI	 <b>Schnabel</b> ENGINEERING
Sample No.	T11-TP4-SS1					
Depth (ft)						
Sample Distribution		Sample Source			GRADATION CURVE	
Sand: 96.6% Silt: 2.1% Clay: 1.3%						
% Passing No. 200	3.4	Natural Moisture Content (%)				Project: Shealy Laboratory LE06030
						Contract No. 9190043.31

Sample tested in accordance with ASTM C136 and or D421/D422



Boring No.		Sample Description	Class	LL	PI	 <b>Schnabel</b> ENGINEERING
Sample No.	T12Tp-1 SS2					
Depth (ft)						
Sample Distribution		Sample Source				<b>GRADATION CURVE</b>
Sand: 98.1% Silt: 0.7 Clay: 1.2%						
% Passing No. 200	1.9	Natural Moisture Content (%)				<b>Project:</b> Shealy Laboratory LD24003
						<b>Contract No.</b> 9190043.25


Sample tested in accordance with ASTM C136 and or D421/D422



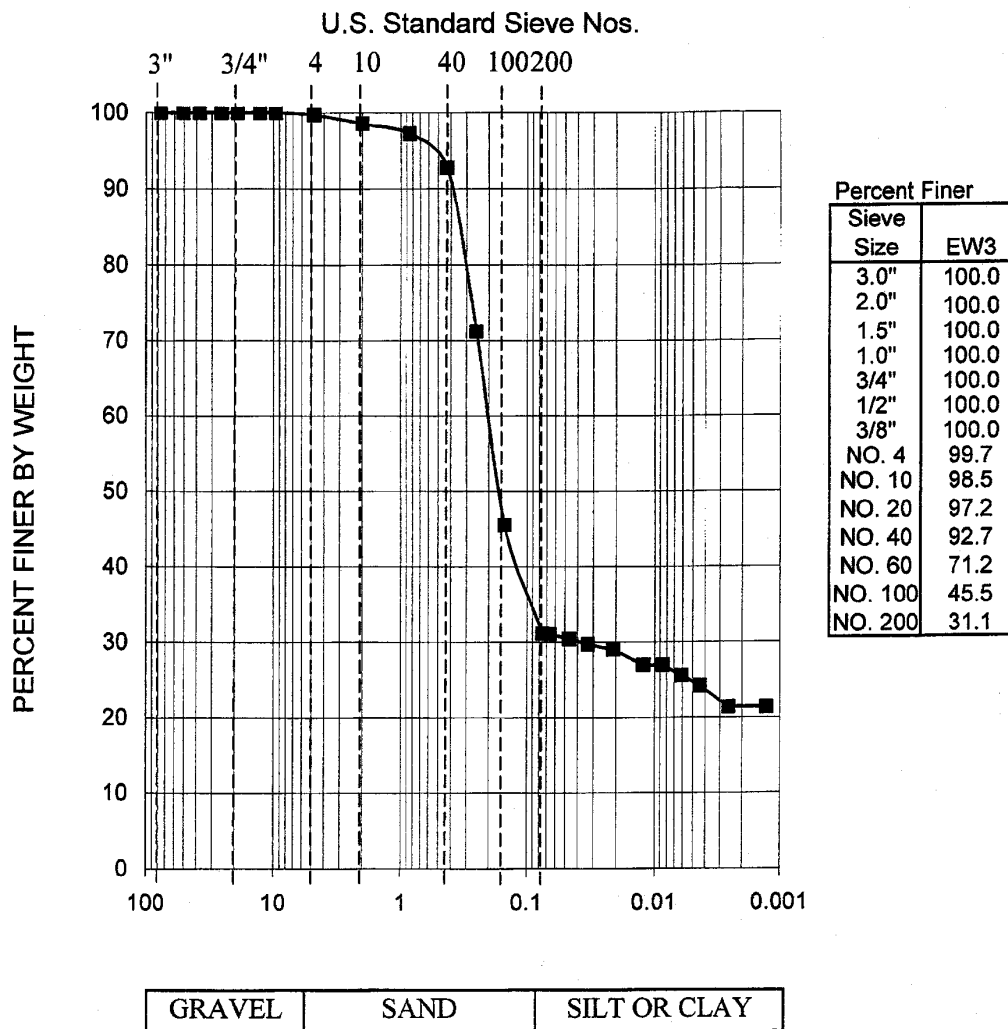
Percent Finer

Sieve Size	EW3
3.0"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
3/4"	100.0
1/2"	100.0
3/8"	100.0
NO. 4	85.6
NO. 10	82.1
NO. 20	78.9
NO. 40	71.4
NO. 60	34.5
NO. 100	9.5
NO. 200	3.6

GRAVEL	SAND	SILT OR CLAY
--------	------	--------------

Boring No.		Sample Description	Class	LL	PI	 <b>Schnabel</b> ENGINEERING
Sample No.	T12Tp-2-SS1					
Depth (ft)						
Sample Distribution		Sample Source		<b>GRADATION CURVE</b>		
Sand: 96.4% Silt: 2.3 Clay: 1.3%						
% Passing No. 200	3.6	Natural Moisture Content (%)		<b>Project:</b> Shealy Laboratory LD24003		
				<b>Contract No.</b> 9190043.26		

Sample tested in accordance with ASTM C136 and or D421/D422



Boring No.		Sample Description	Class	LL	PI	 <b>Schnabel</b> ENGINEERING
Sample No.	T3TP1-SS1					
Depth (ft)						
Sample Distribution		Sample Source		<b>GRADATION CURVE</b>		
Sand: 68.9% Silt: 6.3 Clay: 24.8						
% Passing No. 200	31.1	Natural Moisture Content (%)			<b>Project:</b> Shealy Laboratory LD27010	
				<b>Contract No.</b> 9190043.27		

## **Attachment 5**

### **Data Usability Summary and Data Validation Reports**

# **Data Usability Summary**

## **April and May 2010 Trench Soil Sampling**

### **Raritan Bay Slag Superfund Site, Old Bridge/Sayreville, New Jersey**

#### **A5.1 Overview**

CDM evaluated the quality and usability of data for the April and May 2010 trench soil sampling event as part of the early actions for the Remedial Investigation/Feasibility Study (RI/FS) at the Raritan Bay Slag Superfund Site (the site) located within Old Bridge and Sayreville, New Jersey. The purpose of the trench soil sampling event was to determine the distribution of slag in the vicinity of the seawall and beach to facilitate potential early remedial actions at the site.

CDM's evaluation is based on chemical data quality indicators (DQIs) defined in CDM's Final Quality Assurance Project Plan (QAPP) for Early Actions – Test Pit Investigation, April 2010. Quantitative and qualitative goals and limits were established in the QAPP for field and laboratory data to assess whether the project goals were met. DQIs are expressed in terms of precision, accuracy, representativeness, comparability, completeness, and sensitivity which are defined as follows:

- Precision is a quantitative term that measures the degree of agreement between measurements of the same property and is expressed in terms of relative percent difference (RPD) between duplicate determinations. It is typically assessed through the analysis of duplicate/co-located samples.
- Accuracy is a quantitative term that expresses the degree of agreement for a given measurement against an accepted reference value. It is typically assessed through the analysis of matrix spikes (MSs), laboratory control samples (LCSs), surrogates, calibration check samples, serial dilutions, inductively coupled plasma (ICP) results (ICP interference check standards and ICP serial dilutions).
- Representativeness is a qualitative term that expresses the degree to which sample data represents the actual matrix conditions. Requirements and procedures for sample collection are designed to maximize sample representativeness.
- Comparability is a qualitative term that expresses the confidence with which a data set can be compared with another. Strict adherence to standard sample collection procedures, analytical detection limits, and analytical methods assures that data from like samples and sample conditions are comparable.
- Completeness is a quantitative term that compares the actual amount of valid data obtained versus the amount planned under optimal conditions.
- Sensitivity is a quantitative term that expresses the minimum concentration(s) at which undetected contaminants of interest should be reported to allow comparison with the applicable project criteria.

A summary of the data collected during the April and May 2010 trench soil sampling event is provided below.

- Target Compound List (TCL) volatile organic compounds (VOCs), percent moisture, semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and Target Analyte List (TAL) metals, including mercury (Hg), hexavalent chromium (hexchrom), and cyanide (CN) data from 45 trench soil samples. Total organic carbon (TOC) and pH were collected from seven trench samples.

VOC, SVOC, pesticide, and PCB samples were analyzed by A4 Scientific located in The Woodlands, Texas and metals were analyzed by Chemtech located in Mountainside, New Jersey, both of which are contracted laboratories for the U.S. Environmental Protection Agency's (EPA) Contract Laboratory Program (CLP). Samples were analyzed in accordance with the laboratory's standard operating procedures (SOPs). Samples analyzed at the CLP laboratories were validated by EPA personnel in accordance with EPA protocols. Hexavalent chromium, TOC, and pH samples were analyzed by Shealy Environmental Services (Shealy) located in West Columbia, South Carolina. Samples were analyzed in accordance with the laboratory's standard operating procedures (SOPs).

Sample collection was performed in April and May of 2010 by CDM in accordance with CDM's Final QAPP for Early Actions – Test Pit Investigation (April 2010).

This report addresses the organic and inorganic analyses referenced above that were validated by EPA and reviewed by CDM. CDM reviewed the quality control data results reported from the laboratory for hexavalent chromium and TOC. Holding times and all method blank, laboratory control samples, matrix spike, and matrix spike duplicate criteria were met for these analytes.

## **A5.2 Usability Summary**

Data were collected to support project goals as outlined in the Early Actions – Test Pit Investigation QAPP. The intended uses of the data collected from the test excavation samples were to provide information about the distribution of slag in the vicinity of the seawall and beach in order to facilitate potential early remedial actions at the site and to identify contaminants of concern resulting from the presence of slag. All samples were analyzed using approved analytical methods and method detection limits (MDLs) appropriate for the data uses described above.

In general the majority of the data is usable for project decisions. Originally, 225 sample results, or 2.5 percent of the entire data set, were rejected ("R") due to validation criteria. During CDM's review of the EPA validation reports, an error was discovered regarding the pairing up of field duplicate samples. This error affected the number of rejected and estimated results. EPA was contacted and they resubmitted a corrected data validation report. The number of rejected results is now 2.3 percent of the entire data set or 206 sample results. EPA also corrected the affected

electronic data deliverables (EDDs). Specific details of this error and the corrections are discussed below. The rejected results are not usable for project decisions.

A list of samples analyzed during this sampling event is provided in Table 1. A list of qualifier definitions is provided on Table 2. Sample results qualified as estimated with a "J" or "UJ" are considered usable for project purposes, but should be used with caution. Sample results that have been rejected "R" are not usable for project purposes. The validation reports and case narratives for this report are included in Attachment 1.

Field change requests (FCRs) implemented for the trench soil sampling event included the following: an update to the particulate monitoring action level from 1 milligram per meter cubed ( $\text{mg}/\text{m}^3$ ) to  $0.1 \text{ mg}/\text{m}^3$ ; and the addition of surface soil samples to supplement the existing surface soil data for use in the RI, and the human health and ecological risk assessments. The FCRs implemented do not affect sample results. The addition of surface soil samples provides additional data and enhances the representativeness of the data set.

Field duplicates for this event were required at a frequency of 1 per 20 samples. Up to 120 samples were proposed to be collected based on areas where slag or fill material was expected to be encountered. Only 45 samples were collected based on field observations of slag or fill material in the test pits, which determined that fewer areas were sampled. A total of six field duplicates were collected as the Early Actions – Test Pit Investigation QAPP indicated and therefore the frequency of field duplicate analysis met requirements for all parameters. Table 3 summarizes the number of field samples and field duplicates that were analyzed during this event.

## **A5.3 Data QA/QC Evaluation**

This section presents the DQI results and reconciles these results with the measurement criteria established in the Early Actions – Test Pit Investigation QAPP.

### **A5.3.1 Precision**

#### **A5.3.1.1 Field Precision**

Field precision is determined from the RPDs of field duplicate sample results. The calculated RPD value for all parameters is required to be less than 75 percent. A summary of the RPDs and absolute difference values (ABS) for field duplicate samples is presented on Table 4. The ABS was calculated when a result was detected in one sample and not detected in the other. As standard practice, an ABS of less than 5 times the contract required quantitation limit (CRQL) is considered within acceptable QC limits.

The following parent/field duplicate pairs did not meet RPD criteria:

- Parent Sample T10TP1-SS1 and Duplicate Sample T25TP9-SS4
  - Metals: antimony RPD of 110.2% and beryllium RPD of 98.4%
- Parent Sample T11TP3-SS1 and Duplicate Sample T25TP9-SS6

*Data Usability Summary*  
*Raritan Bay Slag Superfund Site*

- Pesticides: 4,4'-DDE RPD of 97.3%, 4,4'-DDT RPD of 96.3%, dieldrin RPD of 96.2%, endosulfan II RPD of 101.9%, endosulfan sulfate 94.1%, endrin aldehyde RPD of 90.0%, and gamma-chlordane RPD of 92.7%.
- PCBs: Aroclor 1254 RPD of 157.7%.
- Metals: antimony RPD of 103.2%, arsenic RPD of 106.7%, copper RPD of 152.8%, and selenium RPD of 79.1%.
- Parent Sample T1TP3-SS2 and Duplicate Sample T25TP9-SS1
  - Metals: silver RPD of 147.8%.
- Parent Sample T3TP1-SS1 and Duplicate Sample T25TP9-SS2
  - SVOCs: fluoranthene RPD of 104.4% and pyrene RPD of 103.9%.
  - SVOCs SIM: acenaphthylene RPD of 94.0%, anthracene RPD of 97.0%, benzo(a)pyrene RPD of 97.3%, fluoranthene RPD of 88.7%, phenanthrene RPD of 130.2%, and pyrene RPD of 89.9%.
  - Metals: barium RPD of 89.6% and manganese RPD of 82.4%.
- Parent Sample T6TP2-SS1 and Duplicate Sample T25TP9-SS5
  - Metals: antimony RPD of 91.9%, beryllium RPD of 102.7%, and nickel RPD of 90.3%.
- Parent Sample T7TP1-SS2 and Duplicate Sample T25TP9-SS3
  - SVOCs SIM: benzo(a)anthracene RPD of 163.6%, benzo(b)fluoranthene RPD of 169.1%, benzo(g,h,i)perylene RPD of 134.5%, benzo(k)fluoranthene of 159.2%, chrysene RPD of 173.0%, fluoranthene RPD of 172.3%, phenanthrene RPD of 168.0%, and pyrene RPD of 159.0%.
  - Pesticides: 4,4'-DDT ABS of 20.5% and gamma-chlordane ABS of 22.2%.
  - PCBs: Aroclor 1254 RPD of 192.4%.
  - Metals: beryllium RPD of 105.9%, iron RPD of 97.9%, and silver RPD of 79.4%.

Some of the results above fell within the CRQL limits for ABS which required no qualification; all sample results failing the RPD or ABS criteria were qualified by the validators appropriately. No sample results were qualified by CDM based on the field duplicate RPD analysis presented in Table 4.

During the initial review of the EPA validation reports it was noted that EPA validators paired up the wrong samples for the field duplicate comparison for samples MB7Q68 (T9TP2-SS2) and MB7PT0 (T25P9-SS3). These two samples are not field duplicates of each other. MB7PT0 (T25P9-SS3) is a duplicate of sample MB7Q44 (T7TP1-SS2). EPA was contacted and they resubmitted a corrected data validation report, Form Is, and EDDs reflecting the correct field duplicate comparison for MB7PT0 (T25P9-SS3) and MB7Q44 (T7TP1-SS2).

The following summary of the field duplicate review is based on the revised validation reports submitted by EPA.

The EPA Region 2 data reviewers qualified copper as rejected "R" for the following field duplicate pair due to the RPD result greater than 120 percent:

- T11TP3-SS1/T25-TP9-SS6 (MB7PY3/MB7PT3) – copper

#### **A5.3.1.2 Analytical Precision**

For Pesticides, PCBs, and metals including Hg and CN analyses, laboratory duplicate samples and MS/matrix spike duplicates (MSDs), were analyzed as appropriate in accordance with the CLP laboratories' SOPs. A summary of sample results that were qualified due to laboratory precision criteria are presented below.

In SDGs B7PT2, B7Q32 and B7PS8 for Aroclors, the MS/MSD RPD was outside of criteria for Aroclor-1016. In pesticide SDG B7PT2, the heptachlor MS/MSD RPD was outside of criteria. In PCB SDGs B7Q32 and B7PS8, Aroclor-1260 was also outside of criteria. Associated detected analytes were qualified as estimated "J".

For 106 samples, one or more of the following metal detected results were qualified because the RPD laboratory duplicate results were greater than QC criteria when both sample and duplicate results were greater than five times the CRQL: aluminum; antimony; arsenic; barium; cobalt; copper; iron; lead; and manganese. All detected results were qualified as estimated "J" for laboratory duplicate criteria.

The overall laboratory and field precision results were met for most analyses. These sample results should be used with caution when evaluating the data. Originally a total of 22 sample results for 2 field duplicate pairs were rejected due to field duplicate criteria. EPA has corrected the validation reports to reflect the correct field duplicate comparison for the one sample, and only two sample results for one field duplicate pair were rejected due to field duplicate criteria. Both the number of estimated results and rejected results due to exceeded RPD and ABS criteria has been revised. Rejected results are not usable for project purposes. Various sample results were estimated due to precision criteria and caution should be used when evaluating these results at or near project action limits (PALs). Table 5 presents the rejected results for all analyses.

#### **A5.3.2 Accuracy**

Accuracy is the degree of agreement for a given measurement against an accepted reference value. It is typically assessed through the analysis of matrix spike and calibration check samples, and expressed as a percent recovery.

Accuracy for the entire data collection activity is difficult to assess because several sources of error exist. Errors can be introduced by any of the following:

- Sampling procedure
- Field contamination
- Sample preservation and handling
- Sample matrix
- Sample preparation
- Analytical techniques

Accuracy for sampling was maximized through strict adherence to field sampling SOPs, the approved Final Early Actions – Test Pit Investigation QAPP and the use of EPA approved methods for sample analyses. By following approved procedures, results from this sampling event should provide data that are representative of environmental conditions at the time of sampling. The deviations noted in the FCRs above should not affect data accuracy.

As part of the SOP requirements, accuracy is also routinely measured through the analysis of initial and continuing calibration standards, surrogate spike recoveries, LCS/LCSDs, MS/MSDs, and serial dilutions as applicable to the analytical method and project. The following paragraphs summarize whether criteria were met for each QC item.

### **Inorganic Accuracy Results**

#### **Matrix Spike Results**

MS recovery results exceeded QC criteria for antimony, arsenic, barium, cadmium, cobalt, selenium, and thallium in SDG MB7PT4, and for selenium in SDG MB7PX5. Associated sample results were qualified as estimated “J”. The chromium and vanadium MS recoveries in SDG MB7PT4, and the antimony MS recovery in SDG MB7PX5 were less than 10 percent. Fifty-one analytes were rejected “R” by the EPA Region 2 validator in the associated samples. Table 5 presents the rejected results for all analyses.

The TOC results were validated by CDM. All MS recoveries were above criteria. All associated sample results have been qualified as estimated “J”.

#### **Laboratory Control Sample Results**

The LCS recovery for lead was below the lower control limit in three SDGs. Associated sample results for lead in 51 samples were qualified as estimated “J”.

#### **Serial Dilution Results**

The ICP serial dilution analysis yielded percent differences greater than 10 but less than 100 when the initial concentration was equal to or greater than 50 times the MDL for cobalt in SDGs MB7PT4 and MB7PX5. Thirty-two associated detected cobalt results have been qualified estimated “J”.

### **Organic Accuracy Results**

#### **Matrix Spike Results**

##### **Pesticides**

MS/MSDs results exceeded QC criteria for the pesticide samples listed below. The detected sample results were estimated “J” by the validator. Non-detect results for pesticides were estimated as “UJ”.

- T6TP1-SS2 (B7Q32): Aldrin, 4,4'-DDT, Gamma-BHC (Lindane), Dieldrin, Endrin, Heptachlor
- T12TP3-SS2 (B7PZ6): Aldrin, Gamma-BHC (Lindane), Dieldrin, Endrin, Heptachlor

- T4TP2-SS2 (B7Q20): Heptachlor

### **PCBs**

The Aroclor-1260 and Aroclor-1016 MS percent recoveries were outside of criteria in SDG B7Q32. The detected sample results for Aroclor-1260 and Aroclor-1016 were estimated "J" in sample T6TP1-SS2 (B7Q32). In SDG B7PS8, the Aroclor-1260 MS percent recovery was outside of criteria. The detected Aroclor-1260 result in sample T12TP3-SS2 (B7PZ6) was estimated "J".

### **Surrogate Results**

All samples for organic analyses are spiked with surrogate monitoring compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. Surrogate recoveries were within criteria except for 1 or more surrogates in 6 SVOC and 17 VOC samples. Associated sample results were qualified as estimated "J/UJ". None of the sample results were rejected.

### **Calibrations and Compound Identifications**

Calibration verifications monitor instrument stability and performance to determine the continued accuracy of the calibration over time. Parameters, such as sample retention times and resolution criteria, are used for various analyses to ensure correct compound identification. QC issues pertaining to calibrations and sample identifications are discussed below.

### **SIM SVOC**

All relative response factors were within criteria except for pentachlorophenol in the initial and continuing calibrations for SIM SVOA analyses in SDGs B7PT2, B7PT4, B7Q32 and B7PS8. Associated detected sample results have been qualified as estimated "J" and nondetect results have been rejected "R". Table 5 presents the rejected results for all analyses.

For the SIM SVOC analyses, all Relative Standard Deviation (%RSD) results were within criteria except for dibenzo (a,h) anthracene and pentachlorophenol in SDGs B7PT2, B7PT4, B7Q32 and B7PS8. Associated detected sample results were qualified as estimated "J".

All percent difference (%D) results were within criteria except for pentachlorophenol in SVOC SDG B7PT2. Associated sample results were qualified as estimated "J/UJ".

The pentachlorophenol result for sample B7PT4 was qualified as estimated "J/UJ" due to an incorrect calibration sequence. Eight indeno (1,2,3-cd) pyrene results and nine pentachlorophenol results in SDG B7Q32 were also qualified as estimated "J/UJ" due to an incorrect calibration sequence.

Several SIM SVOC results were qualified as estimated "J" in the initial analysis because the reported value was over the calibration range. A list of those compounds was not provided in the validation reports. A diluted run was performed due to the initial run exceeding the calibration range for various analytes and the results were qualified as nondetect "U". The following samples were affected by this criterion:

- T25TP9-SS2 (B7PS9)
- T12TP2-SS1 (B7PZ5)
- T4TP1-SS1 (B7Q15)
- T5TP1-SS1 (B7Q23)

### SVOC

All SVOC percent %RSD results and %D results for initial and continuing calibrations were within criteria except for the %RSD results for benzo (b) fluoranthene, benzo (k) fluoranthene, 2,3,4,6-tetrachlorophenol, and pentachlorophenol in the SVOC analyses in SDGs B7PT2, B7PT4, B7Q32 and B7PS8. Associated detected sample results were qualified as estimated "J".

In SDG B7PS8, 14 pentachlorophenol sample results were qualified as estimated "J/UJ" due to an incorrect calibration sequence.

In SDG B7PT2 the following SVOCs sample results were qualified as estimated "J" because results were detected at levels above the calibration range in the following samples:

- T25TP9-SS5 (B7PT2) - phenanthrene, benzo(a)anthracene, chrysene, benzo(k)fluoranthene, benzo(a)pyrene, indeno (1,2,3-cd)pyrene, and benzo(g,h,i)perylene
- T6TP2-SS1 (B7Q35) - phenanthrene, benzo(a)anthracene, chrysene, benzo (b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno (1,2,3-cd)pyrene, and benzo(g,h,i)perylene
- T8TP2-SS2 (B7Q56) - benzo(k)fluoranthene, benzo(a)pyrene, indeno (1,2,3-cd)pyrene, and benzo(g,h,i)perylene

These results listed above were detected at levels below the CRQL in the dilution runs and could not be reported.

### VOCs

All VOC %RSD results for initial calibrations were within criteria except for bromomethane in the VOA SDG B7PS8 and bromomethane and vinyl chloride in SDG B7PT2. Associated detected sample results were qualified as estimated "J".

All %D results for continuing calibrations were within criteria except for bromomethane and 1,2,4-trichlorobenzene in SDG B7Q32. Associated sample results were qualified as estimated "J/UJ".

### Pesticides

For the pesticide analyses, all initial calibration %RSD results were within criteria except for beta BHC and methoxychlor in SDGs B7PT2, B7PT4, B7Q32 and B7PS8. Associated detected sample results were qualified as estimated "J".

The continuing calibration verification %D for decachlorobiphenyl in SDG B7Q32 was outside the criterion. Associated analytes and sample results were qualified as estimated "J/UJ".

In SDG B7PT2 the individual standard mixture B – calibration verification had a %D for PCB surrogate tetrachloro-m-xylene that was greater than 20%. Associated analytes were qualified as estimated "J/UJ" for 13 samples.

The percent resolutions were outside criteria for 4,4'-DDD and endosulfan I in SDGs B7PT4, B7Q32 and B7PS8. Associated detected sample results are qualified as estimated "JN" and non-detect results are qualified as rejected "R".

Specific samples in pesticide SDG B7PT2 were associated with a Resolution Check Mixture in which the percent resolution between two adjacent peaks in the primary column did not meet the resolution criteria of 80%. Detected results for 4,4'-DDD and endosulfan I in these samples were qualified as estimated "J" and nondetect results were qualified as rejected "R". Table 5 presents the rejected results for all analyses.

In SDG B7PT2 four sample results for endrin are associated with a continuing performance evaluation mixture in which the percent resolution between two adjacent peaks did not meet the resolution criteria and are therefore qualified as estimated. All associated sample results were nondetect and were rejected "R". Table 5 presents the rejected results for all analyses.

During the pesticide analyses, the retention times of reported compounds must fall within the calculated retention time windows for the two chromatographic columns. In SDGs B7PT2 and B7Q32, detected results for various analytes and samples were outside of criteria. Associated sample results were raised to the CRQL value and qualified as nondetect "U", qualified as estimated "J" or qualified as tentatively identified "NJ" depending on the criteria and extent of the outlier. Specific details are presented in the data validation reports in Attachment 1.

### **PCBs**

For the PCB analyses, the retention times of reported compounds must fall within the calculated retention time windows for the two chromatographic columns and a gas chromatograph/mass spectrometer (GC/MS) confirmation is required if the concentration exceeds 10 nanogram per milliliter (ng/ml) in the final sample extract. In SDG B7PT2, the Aroclor-1254 analyte results for three samples had %Ds outside of criteria. Detected Aroclor-1254 results for these samples were qualified as estimated "J".

### **Holding Times, Preservation and Sample Custody**

The holding times were met for all samples, except for one sample for pesticides and PCB analyses. The sample results were qualified with a "J" if detected and a "UJ" if non-detected because the samples were analyzed outside of the extraction holding time criteria:

- FB-042110 (B7PT4): Pesticides and PCBs

The analytical laboratory did not note any problems with the chain of custody seals.

No problems were identified with any of the temperature blanks.

The overall laboratory accuracy results were met for most analyses. Various sample results estimated due to laboratory accuracy criteria should be used with caution when evaluating the data. A total of 204 results were rejected due to various accuracy parameters. The rejected results are not usable for project purposes and caution should be used when evaluating estimated results at or near PALs. Table 5 presents the rejected results for all analyses.

### **A5.3.3 Representativeness**

Sample representativeness was achieved through the use of EPA analytical methods and standard proprietary methods, dedicated and disposable sampling equipment, clean sample gloves, and standard sampling procedures for EPA Region 2, as per the Early Actions Test Pit QAPP requirements. In addition, the sampling scheme included in the QAPP was designed to select samples that are representative of site conditions.

Appropriate laboratory QA/QC requirements were described in CDM's Early Actions – Test Pit Investigation QAPP to ensure that the laboratory analytical results were representative of true field conditions. Field blanks and method blanks were used to ensure representativeness of the samples as described below:

- Field blanks are used to evaluate the presence of contaminants on sampling equipment following decontamination. Decontamination of sampling equipment was not performed because all of the soil samples were collected using dedicated, disposable sampling equipment (disposable scoops and trays). One field blank was collected as a QC check on the disposable sampling equipment.
- Laboratory method blanks are analyzed to indicate possible contamination introduced by sample handling, preparation, and/or analysis.

#### **Field Blanks**

One field blank was collected and analyzed as a check on the disposable sampling equipment that was used. Therefore, the frequency of field blank collection met the Early Actions – Test Pit Investigation QAPP requirements. Analytical results for the field blank, designated as 'FB', are included in Table 6.

The following compounds were detected in the field blank: methylene chloride 4.6 micrograms per liter (µg/L); bis(2-ethylhexyl)phthalate 3.4 µg/L; benzo(a)pyrene 0.17 µg/L; benzo(g,h,i)perylene 0.14 µg/L; dibenzo(a,h)anthracene 0.13 µg/L; indeno(1,2,3-cd)pyrene 0.15 µg/L; naphthalene 0.16 µg/L; barium 0.17 µg/L; and sodium 444 µg/L. The validator appropriately qualified associated sample results as non-detect.

### **Trip Blanks**

Trip blanks were not collected during the trench soil sampling event.

### **Method Blanks**

The following analytes were detected in a calibration or preparation blank and their values were equal to or greater than the method detection limit but less than or equal to the CRQL: antimony; beryllium; cadmium; calcium; copper; lead; magnesium; manganese; nickel; potassium; silver; sodium; thallium; and zinc. The associated sample results were elevated to the CRQL value and qualified as non-detect "U".

The field and method blank results did not indicate a blank contamination problem. The qualification of any associated results due to blank criteria renders the reported values as usable.

## **A5.3.4 Comparability**

Strict adherence to standard sample collection procedures, analytical detection limits, and analytical methods assure that data from like samples and sample conditions are comparable. Comparability criteria are met for the project if the sample collection and analytical procedures are determined to have been followed or did not affect the values reported.

Comparability of data was ensured through the use of standard and consistent sample collection procedures and EPA-approved analytical methods, enabling the current data to be comparable with other data sets generated for this project. All sample data were consistently reported using the same units of measurement, and detection limits were low enough for their intended use.

## **A5.3.5 Sensitivity**

Quantitation limit goals were established in the QAPP for the purpose of ensuring that contaminants of interest were reported to limits that allow comparison with project criteria. The PALs are listed on Worksheet #15 of the Early Actions – Test Pit Investigation QAPP. All quantitation limits used by the laboratories met the project quantitation limit goals (PQLGs), which are also listed on Worksheet #15 of the Early Actions – Test Pit Investigation QAPP, except for the 18 compounds listed in Table 7. The laboratories were able to achieve the PQLGs for 11 of these and many other compounds noted as requiring lowered CRQLs in the QAPP. However, many sample reporting limits for these 11 compounds were slightly above the PQLGs due to soil moisture content. It should be noted that even though the PQLG for the 18 compounds listed on Table 7 were not met in every sample, the laboratory reported CRQLs for all of the compounds were significantly below the standard method CRQLs. The 18 compounds listed in Table 7 are not considered contaminants of interest for this site; therefore, the results for these compounds do not adversely affect the data usability.

The data validation process evaluates the data with respect to compound quantitation limits. If sample results exceed calibration ranges, results are qualified appropriately as estimated "J". Data validation also determines the most valid analyte result to use

for samples that are re-analyzed or diluted. These validated results are entered into the project database and used for decision-making.

### A5.3.6 Completeness

Completeness of the field program is defined as the percentage of samples planned for collection as listed in the QAPP versus the actual samples collected during the field program (See equation A).

Completeness for acceptable data is defined as the percentage of acceptable data obtained judged to be valid versus the total quantity of data generated (See equation B). Acceptable data includes both data that passes all the QC criteria (unqualified data) and data that may not pass all the QC criteria but had appropriate corrective actions taken (qualified but usable data).

$$A. \quad \% \text{ Completeness} = C \times \frac{100}{n}$$

where, C= actual number of samples collected  
n = total number of samples planned

$$B. \quad \% \text{ Completeness} = V \times \frac{100}{n'}$$

where, V= number of measurements judged valid  
n' = total number of measurements made

The overall goal was to generate a complete data set of the samples planned for collection and 90 percent valid data from the samples analyzed. A summary of sample results collected, analyzed, and qualified is presented on Table 8.

A completeness value of 37.5 percent was achieved for sample collection (equation A) for this sampling event. The Early Actions – Test Pit Investigation QAPP goal for the number of samples to be collected was based on areas where slag or fill material was expected to be encountered. Up to 120 samples were proposed to be collected based on project planning. Only 45 samples were collected based on field observations of slag or fill material in the test pits, which determined that fewer areas were sampled.

A completeness value of 97.7 percent was achieved for data validity (equation B), which met the established goal of 90 percent. Overall only 2.3 percent of the data were rejected due to various laboratory and field data validation criteria. This number has been revised to reflect the corrected validation report. The following compounds had a higher level of rejection; pentachlorophenol from the SIM analysis (7.5 percent), pesticides (9.5 percent mostly 4,4-DDD and Endosulfan I), metals (6.7 percent mainly vanadium, antimony, chromium, and copper). Pentachlorophenol results from the regular SVOC analysis should be used instead. These results are not usable for project purposes. All other results are usable for project decisions.

## **A5.4 Summary Assessment of Data Usability and Reconciliation with QAPP Goals**

CDM performed this data usability evaluation to verify conformance with the Early Actions – Test Pit Investigation QAPP requirements and confirm data usability as per the data quality objectives for the project. Sample data were evaluated for precision, accuracy, representativeness, comparability, completeness, and sensitivity. The data usability review results indicate that sufficient valid data were achieved to obtain a usable data set. Data qualified as estimated “J/UJ” are considered usable, but should be used with a degree of caution. Data qualified as rejected “R” should not be used for any purpose.

The quantitation limit goals were above the PQLGs for 2,4-dimethylphenol, 2,4-dinitrophenol, 2,6-dinitrotoluene, 2-chloronaphthalene, and PCBs. These compounds are not considered contaminants of interest for this site; therefore the results for these compounds do not adversely affect the data usability.

As discussed previously in this report, CDM identified an error in the EPA validation reports regarding field duplicate comparisons. This error resulted in rejection of 20 metal analytes in two samples. EPA has since corrected the associated validation reports, Form Is and EDDs. This data usability report and the associated text, tables, and figures in the body of the Test Excavation Data Summary Report have been revised to reflect the corrected validation reports.

# **Attachment 1**

## **Validation Reports**

**Table 1**  
**Analytical Sample Summary**  
**Raritan Slag Site**  
**Old Bridge/Sayreville, New Jersey**

Analytical Methods							pH	TCL Pesticides	Percent Moisture	TAL Metals, Hg & CN	TCL PCBs	TCL VOCs	TCL SVOCs	TCL SIM SVOCs	Total Organic Carbon	Hexavalent Chromium
Location	CLP ID	Sample ID	Sample Date	Start Depth	End Depth	Matrix										
Area-01	B7PW7	T10TP1-SS1	4/30/2010	0	2	SO		X	X	X	X	X	X	X		X
Area-01	B7PW8	T10TP1-SS2	4/30/2010	4	5	SO		X	X	X	X	X	X	X		X
Area-04	B7PX5	T11TP1-SS1	4/29/2010	0	2	SO		X	X	X	X	X	X	X		X
Area-04	B7PX6	T11TP1-SS2	4/29/2010	5.5	6	SO	X	X	X	X	X	X	X	X	X	X
Area-04	B7PX9	T11TP2-SS1	5/4/2010	0	2	SO		X	X	X	X	X	X	X		X
Area-04	B7PY0	T11TP2-SS2	5/4/2010	5	6	SO		X	X	X	X	X	X	X		X
Area-04	B7PY3	T11TP3-SS1	5/4/2010	0	2.5	SO		X	X	X	X	X	X	X		X
Area-04	B7PY4	T11TP3-SS2	5/5/2010	5.5	6	SO		X	X	X	X	X	X	X		X
Area-04	B7PY7	T11TP4-SS1	5/5/2010	0	2	SO	X	X	X	X	X	X	X	X	X	X
Area-04	B7PY8	T11TP5-SS2	5/5/2010	7	7.5	SO		X	X	X	X	X	X	X		
Area-04	B7PZ1	T12TP1-SS1	4/23/2010	0	2	SO		X	X	X	X	X	X	X	X	X
Area-04	B7PZ2	T12TP1-SS2	4/23/2010	9.5	10	SO	X	X	X	X	X	X	X	X	X	X
Area-01	B7PZ5	T12TP2-SS1	4/23/2010	6.5	7	SO	X	X	X	X	X	X	X	X		X
Area-04	B7PZ6	T12TP3-SS2	4/23/2010	6	6.5	SO		X	X	X	X	X	X	X		X
Area-02	B7PT5	T1TP1-SS1	4/22/2010	8.5	9	SO		X	X	X	X	X	X	X		X
Area-02	B7PW0	T1TP2-SS2	4/22/2010	9.5	10	SO		X	X	X	X	X	X	X		X
Area-02	B7PW3	T1TP3-SS1	4/22/2010	0	2	SO		X	X	X	X	X	X	X		X
Area-02	B7PW4	T1TP3-SS2	4/22/2010	9.5	10	SO		X	X	X	X	X	X	X		X
Area-02	B7PS8	T25TP9-SS1	4/22/2010	9.5	10	SO		X	X	X	X	X	X	X		X
Area-01	B7PS9	T25TP9-SS2	4/26/2010	0	2	SO		X	X	X	X	X	X	X		X
Area-01	B7PT0	T25TP9-SS3	4/28/2010	4	5	SO		X	X	X	X	X	X	X		X
Area-01	B7PT1	T25TP9-SS4	4/30/2010	0	2	SO		X	X	X	X	X	X	X		X
Area-04	B7PT2	T25TP9-SS5	5/3/2010	1	2	SO		X	X	X	X	X	X	X		X
Area-04	B7PT3	T25TP9-SS6	5/5/2010	0	2.5	SO		X	X	X	X	X	X	X		X
Area-02	B7PZ9	T2TP1-SS1	4/21/2010	4	4.5	SO		X	X	X	X	X	X	X		X
Area-02	B7Q04	T2TP2-SS2	4/21/2010	7.5	8	SO		X	X	X	X	X	X	X		X
Area-02	B7Q05	T2TP2-SS3	4/21/2010	6.5	7	SO		X	X	X	X	X	X	X		X
Area-02	B7Q06	T2TP2-SS4	4/22/2010	0	1	SO		X	X	X	X	X	X	X		X
Area-01	B7Q07	T3TP1-SS1	4/26/2010	0	2	SO		X	X	X	X	X	X	X		X
Area-01	B7Q08	T3TP1-SS2	4/26/2010	4	4.5	SO	X	X	X	X	X	X	X	X	X	X
Area-01	B7Q09	T3TP1-SS3	4/26/2010	7.5	8	SO		X	X	X	X	X	X	X		X
Area-01	B7Q15	T4TP1-SS1	4/26/2010	0	2	SO		X	X	X	X	X	X	X		X
Area-01	B7Q16	T4TP1-SS2	4/26/2010	8	8.5	SO		X	X	X	X	X	X	X		X
Area-04	B7Q19	T4TP2-SS1	5/3/2010	0	2	SO		X	X	X	X	X	X	X		X
Area-04	B7Q20	T4TP2-SS2	5/3/2010	5	6	SO	X	X	X	X	X	X	X	X	X	X
Area-01	B7Q23	T5TP1-SS1	4/29/2010	0	2	SO		X	X	X	X	X	X	X		X
Area-01	B7Q24	T5TP1-SS2	4/29/2010	6	7	SO		X	X	X	X	X	X	X		X
Area-01	B7Q31	T6TP1-SS1	4/27/2010	0	2	SO		X	X	X	X	X	X	X		X
Area-01	B7Q32	T6TP1-SS2	4/27/2010	4	4.5	SO		X	X	X	X	X	X	X		X
Area-04	B7Q35	T6TP2-SS1	5/3/2010	1	2	SO		X	X	X	X	X	X	X		X
Area-04	B7Q36	T6TP2-SS2	5/3/2010	4	5	SO		X	X	X	X	X	X	X		X
Area-01	B7Q43	T7TP1-SS1	4/28/2010	0	2	SO		X	X	X	X	X	X	X		X
Area-01	B7Q44	T7TP1-SS2	4/28/2010	4	5	SO		X	X	X	X	X	X	X		X
Area-01	B7Q51	T8TP1-SS1	4/27/2010	5	6	SO		X	X	X	X	X	X	X		X
Area-04	B7Q55	T8TP2-SS1	5/4/2010	0	2	SO		X	X	X	X	X	X	X		X
Area-04	B7Q56	T8TP2-SS2	5/4/2010	7	9	SO		X	X	X	X	X	X	X		X
Area-04	B7Q59	T8TP3-SS1	5/4/2010	2	2.5	SO		X	X	X	X	X	X	X		X
Area-04	B7Q60	T8TP3-SS2	5/4/2010	4	4.5	SO		X	X	X	X	X	X	X		X
Area-01	B7Q63	T9TP1-SS1	4/28/2010	5	5.5	SO		X	X	X	X	X	X	X		X
Area-04	B7Q67	T9TP2-SS1	4/28/2010	1	2	SO	X	X	X	X	X	X	X	X	X	X
Area-01	B7Q68	T9TP2-SS2	4/28/2010	0	1.25	SO		X	X	X	X	X	X	X		X

**Acronyms:**

CLP - Contract Laboratory Program  
ID - identification  
SO - soil  
TAL - target analyte list

CN - cyanide  
PCBs - polychlorinated biphenyls  
SVOCs - semi-volatile organic compounds  
TCL - target compound list

Hg - mercury  
SIM - selective ion monitoring  
VOCs - volatile organic compounds

**Table 2**  
**Sample Analyses Qualifiers**  
**Raritan Slag Site, Old Bridge/Sayreville, New Jersey**

U	=	Indicates that the compound was analyzed for but not detected at or above the reporting limit.
J	=	Estimated data. Value may be less than the reporting limits but greater than the method detection limit, or indicates that data do not meet performance criteria and data quality indicators.
R	=	Data is rejected due to not meeting quality control criteria.
N	=	Indicates the lack of accuracy in the reported result, and is applied when matrix spiked sample recovery is outside the control limits.

**Table 3**  
**Raritan Slag Sample Collection**  
**Raritan Slag Site, Old Bridge/Sayreville, New Jersey**

Parameter	Method	Samples	Field Duplicates
VOCs	SOM01.2	45	6
SVOCs	SOM01.2	45	6
SVOCs	SOM01.2 SIM	45	6
Pesticides	SOM01.2	45	6
PCBs	SOM01.2	45	6
Metals, Hg & CN	ILM05.4	45	6
Hexavalent Chromium	SW-846, 3060A/7196A	45	6
TOC	Lloyd Kahn	7	0
pH	9045D	7	0

**Acronyms:**

CN – cyanide

Hg – mercury

PCBs – polychlorinated biphenyls

SIM – selective ion monitoring

SVOCs - semi-volatile organic compounds

VOCs – volatile organic compounds

TOC – total organic carbon

Table 4  
Field Duplicate Results  
Raritan Slag Site  
Old Bridge/Sayerville, New Jersey

Sample Identification (ID) CLP ID Sample Date	T10TP1-SS1 B7PW7 4/30/2010	T25TP9-SS4 B7PT1 4/30/2010	RPD Criteria <75%	ABS Criteria <5xCRQL	T11TP3-SS1 B7PY3 5/4/2010	T25TP9-SS6 B7PT3 5/5/2010	RPD Criteria <75%	ABS Criteria <5xCRQL	T1TP3-SS2 B7PW4 4/22/2010	T25TP9-SS1 B7PS8 4/22/2010	RPD Criteria <75%	ABS Criteria <5xCRQL
VOCs (µg/kg)												
1,1,1-Trichloroethane	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
1,1,2,2-Tetrachloroethane	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
1,1,2-Trichloro-1,2,2-trifluoroethane	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
1,1,2-Trichloroethane	4.5 U	5.7 UJ	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
1,1-Dichloroethane	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
1,1-Dichloroethene	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
1,2,3-Trichlorobenzene	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
1,2,4-Trichlorobenzene	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
1,2-Dibromo-3-chloropropane	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
1,2-Dibromoethane	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
1,2-Dichlorobenzene	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
1,2-Dichloroethane	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
1,2-Dichloropropane	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
1,3-Dichlorobenzene	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
1,4-Dichlorobenzene	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
1,4-Dioxane	90 U	110 U	NC		110 U	110 U	NC		120 U	120 U	NC	
2-Butanone	9 U	11 U	NC		11 U	11 U	NC		12 U	12 U	NC	
2-Hexanone	9 U	11 U	NC		11 U	11 U	NC		12 U	12 U	NC	
4-Methyl-2-Pentanone	9 U	11 U	NC		11 U	11 U	NC		12 U	12 U	NC	
Acetone	9 U	11 U	NC		11 U	11 U	NC		76	38	66.7	
Benzene	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
Bromochloromethane	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
Bromodichloromethane	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
Bromoform	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
Bromomethane	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
Carbon Disulfide	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
Carbon tetrachloride	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
Chlorobenzene	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
Chloroethane	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
Chloroform	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
Chloromethane	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
cis-1,2-Dichloroethene	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
cis-1,3-Dichloropropene	4.5 U	5.7 UJ	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
Cyclohexane	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
Dibromochloromethane	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
Dichlorodifluoromethane	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
Ethylbenzene	4.5 U	5.7 U	NC		5.6 U	5.6 UJ	NC		5.9 U	6 U	NC	
Isopropylbenzene	4.5 U	5.7 U	NC		5.6 U	5.6 UJ	NC		5.9 U	6 U	NC	
m,p-Xylene	4.5 U	5.7 U	NC		5.6 U	5.6 UJ	NC		5.9 U	6 U	NC	
Methyl Acetate	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
Methyl tert-Butyl Ether	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
Methylcyclohexane	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
Methylene chloride	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
o-Xylene	4.5 U	5.7 U	NC		5.6 U	5.6 UJ	NC		5.9 U	6 U	NC	
Styrene	4.5 U	5.7 U	NC		5.6 U	5.6 UJ	NC		5.9 U	6 U	NC	
Tetrachloroethene	4.5 U	5.7 U	NC		5.6 U	5.6 UJ	NC		5.9 U	6 U	NC	
Toluene	4.5 U	5.7 U	NC		5.6 U	5.6 UJ	NC		5.9 U	6 U	NC	
VOCs (µg/kg)												
trans-1,2-Dichloroethene	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
trans-1,3-Dichloropropene	4.5 U	5.7 UJ	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
Trichloroethene	4.5 U	5.7 U	NC		5.6 U	5.6 UJ	NC		5.9 U	6 U	NC	
Trichlorofluoromethane	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	

Table 4  
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Sample Identification (ID) CLP ID Sample Date	T10TP1-SS1 B7PW7 4/30/2010	T25TP9-SS4 B7PT1 4/30/2010	RPD Criteria <75%	ABS Criteria <5xCRQL	T11TP3-SS1 B7PY3 5/4/2010	T25TP9-SS6 B7PT3 5/5/2010	RPD Criteria <75%	ABS Criteria <5xCRQL	T1TP3-SS2 B7PW4 4/22/2010	T25TP9-SS1 B7PS8 4/22/2010	RPD Criteria <75%	ABS Criteria <5xCRQL
Vinyl Chloride	4.5 U	5.7 U	NC		5.6 U	5.6 U	NC		5.9 U	6 U	NC	
SVOCs (µg/kg)												
1,1'-Biphenyl	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
1,2,4,5-Tetrachlorobenzene	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
2,4,5-Trichlorophenol	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
2,4,6-Trichlorophenol	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
2,4-Dichlorophenol	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
2,4-Dimethylphenol	37 U	36 U	NC		37 U	37 U	NC		39 U	40 U	NC	
2,4-Dinitrophenol	68 U	67 U	NC		68 U	68 U	NC		72 U	73 U	NC	
2,4-Dinitrotoluene	37 U	36 U	NC		37 U	37 U	NC		39 U	40 U	NC	
2,6-Dinitrotoluene	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
2-Chloronaphthalene	37 U	36 U	NC		37 U	37 U	NC		39 U	40 U	NC	
2-Chlorophenol	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
2-Methylnaphthalene	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
2-Methylphenol	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
2-Nitroaniline	370 U	360 U	NC		370 U	370 U	NC		390 U	400 U	NC	
2-Nitrophenol	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
3,3'-Dichlorobenzidine	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
3-Nitroaniline	370 U	360 U	NC		370 U	370 U	NC		390 U	400 U	NC	
4,6-Dinitro-2-Methylphenol	160 U	150 U	NC		160 U	160 U	NC		160 U	170 U	NC	
4-Bromophenyl Phenyl Ether	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
4-Chloro-3-Methylphenol	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
4-Chloroaniline	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
4-Chlorophenyl Phenylether	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
4-Methylphenol	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
4-Nitroaniline	370 U	360 U	NC		370 U	370 U	NC		390 U	400 U	NC	
4-Nitrophenol	370 U	360 U	NC		370 U	370 U	NC		390 U	400 U	NC	
Acenaphthene	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
Acenaphthylene	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
Acetophenone	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
Anthracene	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
Atrazine	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
Benzaldehyde	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
Benzo(a)anthracene	170 U	170 U	NC		170 U	170 U	NC		180 U	180 U	NC	
Benzo(a)pyrene	37 U	36 U	NC		37 U	37 U	NC		39 U	40 U	NC	
Benzo(b)fluoranthene	170 U	170 U	NC		170 U	170 U	NC		180 U	180 U	NC	
Benzo(g,h,i)perylene	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
Benzo(k)fluoranthene	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
Bis(2-Chloroethoxy) methane	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
Bis(2-Chloroethyl) ether	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
Bis(2-Ethylhexyl) phthalate	190 U	190 U	NC		49 J	190 U		141.0	200 U	200 U	NC	
Bis-Chloroisopropyl ether	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
Butylbenzylphthalate	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
SVOCs (µg/kg)												
Caprolactam	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
Carbazole	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
Chlorophenols	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
Chrysene	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
Dibenzo(a,h)anthracene	37 U	36 U	NC		37 U	37 U	NC		39 U	40 U	NC	
Dibenzofuran	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
Diethylphthalate	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
Dimethylphthalate	190 U	190 U	NC		190 U	190 U	NC		200 U	200 U	NC	
Di-N-Butylphthalate	170 U	170 U	NC		170 U	170 U	NC		180 U	180 U	NC	

Table 4  
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Sample Identification (ID) CLP ID Sample Date	T10TP1-SS1 B7PW7 4/30/2010		T25TP9-SS4 B7PT1 4/30/2010		RPD Criteria <75%	ABS Criteria <5xCRQL	T11TP3-SS1 B7PY3 5/4/2010		T25TP9-SS6 B7PT3 5/5/2010		RPD Criteria <75%	ABS Criteria <5xCRQL	T1TP3-SS2 B7PW4 4/22/2010		T25TP9-SS1 B7PS8 4/22/2010		RPD Criteria <75%	ABS Criteria <5xCRQL
Di-N-Octyl Phthalate	190	U	190	U	NC		190	U	190	U	NC		200	U	200	U	NC	
<b>Fluoranthene</b>	190	U	190	U	NC		190	U	190	U	NC		200	U	200	U	NC	
Fluorene	190	U	190	U	NC		190	U	190	U	NC		200	U	200	U	NC	
Hexachlorobenzene	190	U	190	U	NC		190	U	190	U	NC		200	U	200	U	NC	
Hexachlorobutadiene	45	U	44	U	NC		44	U	45	U	NC		47	U	48	U	NC	
Hexachlorocyclopentadiene	190	U	190	U	NC		190	U	190	U	NC		200	U	200	U	NC	
Hexachloroethane	190	U	190	U	NC		190	U	190	U	NC		200	U	200	U	NC	
Indeno(1,2,3-Cd)Pyrene	170	U	170	U	NC		170	U	170	U	NC		180	U	180	U	NC	
Isophorone	190	U	190	U	NC		190	U	190	U	NC		200	U	200	U	NC	
Naphthalene	190	U	190	U	NC		190	U	190	U	NC		200	U	200	U	NC	
Nitrobenzene	190	U	190	U	NC		190	U	190	U	NC		200	U	200	U	NC	
N-Nitroso-Di-N-Propylamine	77	U	76	U	NC		77	U	77	U	NC		81	U	83	U	NC	
N-Nitrosodiphenylamine	190	U	190	U	NC		190	U	190	U	NC		200	U	200	U	NC	
Pentachlorophenol	130	U	130	U	NC		130	U	130	U	NC		140	UJ	140	U	NC	
Phenanthrene	190	U	190	U	NC		190	U	190	U	NC		200	U	200	U	NC	
Phenol	190	U	190	U	NC		190	U	190	U	NC		200	U	200	U	NC	
<b>Pyrene</b>	190	U	190	U	NC		190	U	190	U	NC		200	U	200	U	NC	
<b>SIM SVOCs (µg/kg)</b>																		
2-Methylnaphthalene	3.7	U	3.6	U	NC		3.7	U	3.7	U	NC		3.9	U	4	U	NC	
Acenaphthene	3.7	U	3.6	U	NC		3.7	U	3.7	U	NC		3.9	U	4	U	NC	
<b>Acenaphthylene</b>	3.7	U	3.6	U	NC		3.7	U	3.7	U	NC		3.9	U	4	U	NC	
<b>Anthracene</b>	3.7	U	3.6	U	NC		3.7	U	3.7	U	NC		3.9	U	4	U	NC	
<b>Benzo(a)anthracene</b>	3.7	U	3.1	J		0.6	3.4	J	2.1	J	47.3		4.1		4.7		13.6	
<b>Benzo(a)pyrene</b>	3.7	U	7			3.3	7		3.8	U		3.2	8		6.7		17.7	
<b>Benzo(b)fluoranthene</b>	4.1		6.7		48.1		6		6.5		8.0		6.7		7.9		16.4	
<b>Benzo(g,h,i)perylene</b>	4.5		6.6		37.8		5.4		5.4		0.0		6.3		7.3		14.7	
<b>Benzo(k)fluoranthene</b>	1.9	J	3.5	J	59.3		3.7	J	2.9	J	24.2		4.3		4.5		4.5	
<b>Chrysene</b>	3.7	U	3.7			0.0	4.5		2.5	J	57.1		4.2		4.7		11.2	
Dibenzo(a,h)anthracene	3.7	U	3.9	J		0.2	3.7	UJ	3.7	UJ	NC		4.1	J	5.4	J	27.4	
<b>Fluoranthene</b>	2.7	J	4.3		45.7		4.6		3.4	J	30.0		5.7		6.4		11.6	
Fluorene	3.7	U	3.6	U	NC		3.7	U	3.7	U	NC		3.9	U	4	U	NC	
Indeno(1,2,3-Cd)Pyrene	4.6	J	7.2	J	44.1		5.4	U	6.8			1.4	6.9		8.9		25.3	
Naphthalene	3.7	U	2	J		1.7	3.7	U	3.7	U	NC		3.9	U	4	U	NC	
Pentachlorophenol	7.5	R	7.4	R	NC		7.5	R	7.5	R	NC		7.9	R	8	R	NC	
<b>Phenanthrene</b>	1.8	J	2.3	J	24.4		3	J	2.6	J	14.3		3.4	J	3.4	J	0.0	
<b>Pyrene</b>	4.4		7.8		55.7		8.2		5.5		39.4		8.6		8.1		6.0	
<b>Pesticides (µg/kg)</b>																		
4,4'-DDD	3.6	R	3.6	R	NC		3.6	R	3.7	R	NC		3.8	R	3.9	R	NC	
<b>4,4'-DDE</b>	3.6	U	3.6	U	NC		3.8	NJ	11	NJ	97.3		3.8	U	3.9	U	NC	
<b>4,4'-DDT</b>	3.6	U	3.6	U	NC		14	NJ	40	JN	96.3		3.8	U	3.9	U	NC	
Aldrin	1.9	U	1.9	U	NC		1.9	UJ	1.9	UJ	NC		2	U	2	U	NC	
Alpha-Bhc	1.9	U	1.9	U	NC		1.9	U	1.9	U	NC		2	U	2	U	NC	
Alpha-Chlordane	1.9	U	1.9	U	NC		1.9	UJ	1.9	UJ	NC		2	U	2	U	NC	
Beta-Bhc	1.9	U	1.9	U	NC		1.9	UJ	1.9	UJ	NC		2	U	2	U	NC	
Chlorinated Camphene	120	U	120	U	NC		120	U	120	U	NC		130	U	130	U	NC	
Delta-BHC	1.9	U	1.9	U	NC		1.9	UJ	1.9	UJ	NC		2	U	2	U	NC	
<b>Dieldrin</b>	3.6	U	3.6	U	NC		3.4	J	9.7	NJ	96.2		3.8	U	3.9	U	NC	
Endosulfan I	1.9	R	1.9	R	NC		1.9	R	1.9	R	NC		2	R	2	R	NC	
<b>Endosulfan II</b>	3.6	U	3.6	U	NC		3.9	J	12	J	101.9		3.8	U	3.9	U	NC	
<b>Endosulfan Sulfate</b>	3.6	U	3.6	U	NC		1.8	J	5	J	94.1		3.8	U	3.9	U	NC	
Endrin	3.6	U	3.6	U	NC		3.8	U	6.4	NJ		2.6	3.8	U	3.9	U	NC	
<b>Endrin Aldehyde</b>	3.6	U	3.6	U	NC		3.3	J	8.7	J	90.0		3.8	U	3.9	U	NC	
Endrin Ketone	3.6	U	3.6	U	NC		3.6	UJ	3.7	UJ	NC		3.8	U	3.9	U	NC	

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Sample Identification (ID) CLP ID Sample Date	T10TP1-SS1 B7PW7 4/30/2010	T25TP9-SS4 B7PT1 4/30/2010	RPD Criteria <75%	ABS Criteria <5xCRQL	T11TP3-SS1 B7PY3 5/4/2010	T25TP9-SS6 B7PT3 5/5/2010	RPD Criteria <75%	ABS Criteria <5xCRQL	T1TP3-SS2 B7PW4 4/22/2010	T25TP9-SS1 B7PS8 4/22/2010	RPD Criteria <75%	ABS Criteria <5xCRQL
Gamma-Bhc (Lindane)	1.9 U	1.9 U	NC		1.9 U	1.9 U	NC		2 U	2 U	NC	
Gamma-Chlordane	1.9 U	1.9 U	NC		5.5 J	15 NJ	92.7		2 U	2 U	NC	
Heptachlor	1.9 U	1.9 U	NC		1.9 U	1.9 U	NC		2 U	2 U	NC	
Heptachlor Epoxide	1.9 U	1.9 U	NC		1.9 UJ	1.9 UJ	NC		2 U	2 U	NC	
Methoxychlor	19 U	19 U	NC		19 U	21 J		2.0	20 U	20 U	NC	
PCBs (µg/kg)												
Aroclor 1016	1.9 U	1.9 U	NC		1.9 U	19 U	NC		2 U	2 U	NC	
Aroclor 1221	1.9 U	1.9 U	NC		1.9 U	19 U	NC		2 U	2 U	NC	
Aroclor 1232	1.9 U	1.9 U	NC		1.9 U	19 U	NC		2 U	2 U	NC	
Aroclor 1242	1.9 U	1.9 U	NC		1.9 U	19 U	NC		2 U	2 U	NC	
Aroclor 1248	1.9 U	1.9 U	NC		1.9 U	19 U	NC		2 U	2 U	NC	
Aroclor 1254	5	7.1	34.7		130	1100	157.7		2 U	2 U	NC	
Aroclor 1260	1.9 U	1.9 U	NC		1.9 U	19 U	NC		2 U	2 U	NC	
Aroclor 1262	1.9 U	1.9 U	NC		1.9 U	19 U	NC		2 U	2 U	NC	
Aroclor 1268	1.9 U	1.9 U	NC		1.9 U	19 U	NC		2 U	2 U	NC	
Metals (mg/kg)												
Aluminum	1550	1630	5.0		1860	1420	26.8		5120	3640	33.8	
Antimony	0.81	2.8	110.2		7.2	2.3	103.2		0.32	0.43	29.3	
Arsenic	4	7.3	58.4		80.2	24.4	106.7		6.5	6.3	3.1	
Barium	7.7	14.5	61.3		9.5	12.5	27.3		35.7	34.1	4.6	
Beryllium	0.47	0.16	98.4		0.58	0.59	1.7		0.89	0.43	69.7	
Cadmium	0.043	0.054	22.7		0.1	0.078	24.7		0.16	0.11	37.0	
Calcium	469	533	12.8		580	586	1.0		888	892	0.4	
Chromium	5.3	6.7	23.3		5.3	5.9	10.7		12.9	10.8	17.7	
Chromium (Hexavalent Compounds)	1.1 UJ	1.1 UJ	NC		1.1	1.2	8.7		1.2 UJ	1.2 UJ	NC	
Cobalt	0.8	0.93	15.0		0.9	1.3	36.4		2.7	2.6	3.8	
Copper	14.4	12.3	15.7		325	43.5	152.8		14.9	11.9	22.4	
Cyanide	1.4	1.5	6.9		1.5	1.6	6.5		1.6	1.5	6.5	
Iron	8500	9430	10.4		14600	8150	56.7		11700	14100	18.6	
Metals (mg/kg)												
Lead	17.3	22.4	25.7		28.1	15.4	58.4		20.2	19.7	2.5	
Magnesium	469	533	12.8		580	586	1.0		1150	760	40.8	
Manganese	20.3	18.6	8.7		23.6	15.3	42.7		54	36.7	38.1	
Mercury	0.028	0.02	33.3		0.029	0.03	3.4		0.03	0.038	23.5	
Nickel	0.8	0.63	23.8		4.6	4.7	2.2		13.4	7.3	58.9	
Potassium	101	114	12.1		105	84.5	21.6		931	668	32.9	
Selenium	0.16	0.21	27.0		0.3	0.13	79.1	0.2	0.4	0.49	20.2	
Silver	0.94	1.1	15.7		1.2	1.2	0.0		1	0.15	147.8	0.9
Sodium	469	533	12.8		580	589	1.5		512	514	0.4	
Thallium	0.036	0.073	67.9		0.029	0.034	15.9		0.09	0.093	3.3	
Vanadium	10.1	13.7	30.3		10.8	11.3	4.5		29.7	20	39.0	
Zinc	8.4	9.2	9.1		16.2	8.3	64.5		58	39.9	37.0	

Notes:

- Absolute difference value (ABS) was calculated when duplicate pairs were detect for one sample and non-detect for the other.
- Qualifiers are as follows: U = non-detect; J = estimated; and R = rejected.
- Values bolded in red exceed either the relative percent difference (RPD) criteria.

Acronyms:

ABS - absolute value	CLP - Contract Laboratory Program	CRQL - Contract Required Quantitation Limit	NC - not calculated
mg/kg - milligram per kilogram	PCBs - polychlorinated biphenyls	RPD - relative percent difference	SIM - selective ion monitoring
SVOCs - semi-volatile organic compounds	VOCs - volatile organic compounds	µg/kg - microgram per kilogram	

**Table 4**  
**Field Duplicate Results**  
**Raritan Slag Site**  
**Old Bridge/Sayerville, New Jersey**

Sample Identification (ID) CLP ID Sample Date	T25TP9-SS2 B7PS9 4/26/2010		T3TP1-SS1 B7Q07 4/26/2010		RPD Criteria <75%	ABS Criteria <5xCRQL	T25TP9-SS5 B7PT2 5/3/2010		T6TP2-SS1 B7Q35 5/3/2010		RPD Criteria <75%	ABS Criteria <5xCRQL	T25TP9-SS3 B7PT0 4/28/2010		T7TP1-SS2 B7Q44 4/28/2010		RPD Criteria <75%	ABS Criteria <5xCRQL
VOCs (µg/kg)																		
1,1,1-Trichloroethane	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
1,1,2,2-Tetrachloroethane	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5		5.7	U		0.2
1,1,2-Trichloroethane	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
1,1-Dichloroethane	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
1,1-Dichloroethene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
1,2,3-Trichlorobenzene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
1,2,4-Trichlorobenzene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	UJ	5.7	UJ	NC	
1,2-Dibromo-3-chloropropane	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
1,2-Dibromoethane	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
1,2-Dichlorobenzene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
1,2-Dichloroethane	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
1,2-Dichloropropane	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
1,3-Dichlorobenzene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
1,4-Dichlorobenzene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
1,4-Dioxane	110	U	110	U	NC		110	U	110	U	NC		110	U	110	U	NC	
2-Butanone	11	U	11	U	NC		11	U	11	U	NC		11	U	11	U	NC	
2-Hexanone	11	U	11	U	NC		11	U	11	U	NC		11	U	11	U	NC	
4-Methyl-2-Pentanone	11	U	11	U	NC		11	U	11	U	NC		11	U	11	U	NC	
Acetone	11	U	11	U	NC		11	U	11	U	NC		11	U	11	U	NC	
Benzene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Bromochloromethane	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Bromodichloromethane	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Bromoform	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Bromomethane	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Carbon Disulfide	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Carbon tetrachloride	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Chlorobenzene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Chloroethane	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Chloroform	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Chloromethane	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
cis-1,2-Dichloroethene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
cis-1,3-Dichloropropene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Cyclohexane	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Dibromochloromethane	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Dichlorodifluoromethane	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Ethylbenzene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Isopropylbenzene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
m,p-Xylene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Methyl Acetate	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Methyl tert-Butyl Ether	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Methylcyclohexane	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Methylene chloride	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
o-Xylene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Styrene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Tetrachloroethene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Toluene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
VOCs (µg/kg)																		
trans-1,2-Dichloroethene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
trans-1,3-Dichloropropene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Trichloroethene	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
Trichlorofluoromethane	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	

**Table 4**  
**Field Duplicate Results**  
**Raritan Slag Site**  
**Old Bridge/Sayerville, New Jersey**

Sample Identification (ID) CLP ID Sample Date	T25TP9-SS2 B7PS9 4/26/2010		T3TP1-SS1 B7Q07 4/26/2010		RPD Criteria <75%	ABS Criteria <5xCRQL	T25TP9-SS5 B7PT2 5/3/2010		T6TP2-SS1 B7Q35 5/3/2010		RPD Criteria <75%	ABS Criteria <5xCRQL	T25TP9-SS3 B7PT0 4/28/2010		T7TP1-SS2 B7Q44 4/28/2010		RPD Criteria <75%	ABS Criteria <5xCRQL
Vinyl Chloride	5.6	U	5.6	U	NC		5.7	U	5.6	U	NC		5.5	U	5.7	U	NC	
<b>SVOCs (µg/kg)</b>																		
1,1'-Biphenyl	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
1,2,4,5-Tetrachlorobenzene	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
2,4,5-Trichlorophenol	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
2,4,6-Trichlorophenol	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
2,4-Dichlorophenol	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
2,4-Dimethylphenol	37	U	37	U	NC		38	U	37	U	NC		36	U	38	U	NC	
2,4-Dinitrophenol	68	U	68	U	NC		70	U	69	U	NC		67	U	70	U	NC	
2,4-Dinitrotoluene	37	U	37	U	NC		38	U	37	U	NC		36	U	38	U	NC	
2,6-Dinitrotoluene	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
2-Chloronaphthalene	37	U	37	U	NC		38	U	37	U	NC		36	U	38	U	NC	
2-Chlorophenol	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
2-Methylnaphthalene	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
2-Methylphenol	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
2-Nitroaniline	370	U	370	U	NC		380	U	370	U	NC		360	U	380	U	NC	
2-Nitrophenol	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
3,3'-Dichlorobenzidine	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
3-Nitroaniline	370	U	370	U	NC		380	U	370	U	NC		360	U	380	U	NC	
4,6-Dinitro-2-Methylphenol	160	U	160	U	NC		160	U	160	U	NC		150	U	160	U	NC	
4-Bromophenyl Phenyl Ether	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
4-Chloro-3-Methylphenol	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
4-Chloroaniline	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
4-Chlorophenyl Phenylether	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
4-Methylphenol	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
4-Nitroaniline	370	U	370	U	NC		380	U	370	U	NC		360	U	380	U	NC	
4-Nitrophenol	370	U	370	U	NC		380	U	370	U	NC		360	U	380	U	NC	
Acenaphthene	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
Acenaphthylene	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
Acetophenone	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
Anthracene	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
Atrazine	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
Benzaldehyde	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
Benzo(a)anthracene	35	J	170	U		135.0	19	J	170	U	NC	151.0	160	U	23	J		137.0
Benzo(a)pyrene	35	J	37	U		2.0	21	J	19	J	10.0		36	U	26	J		10.0
Benzo(b)fluoranthene	36	J	170	U		134.0	170	U	170	U	NC		160	U	33	J		127.0
Benzo(g,h,i)perylene	33	J	190	U		157.0	190	U	190	U	NC		190	U	32	J		158.0
Benzo(k)fluoranthene	27	J	190	U		163.0	190	U	190	U	NC		190	U	24	J		166.0
Bis(2-Chloroethoxy) methane	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
Bis(2-Chloroethyl) ether	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
Bis(2-Ethylhexyl) phthalate	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
Bis-Chloroisopropyl ether	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
Butylbenzylphthalate	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
<b>SVOCs (µg/kg)</b>																		
Caprolactam	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
Carbazole	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
Chlorophenols	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
Chrysene	39	J	190	U		151.0	22	J	190	U		168.0	190	U	36	J		154.0
Dibenzo(a,h)anthracene	37	U	37	U	NC		38	U	37	U	NC		36	U	38	U	NC	
Dibenzofuran	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
Diethylphthalate	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
Dimethylphthalate	190	U	190	U	NC		190	U	190	U	NC		190	U	190	U	NC	
Di-N-Butylphthalate	170	U	170	U	NC		170	U	170	U	NC		160	U	170	U	NC	

Table 4  
Field Duplicate Results  
Raritan Slag Site  
Old Bridge/Sayerville, New Jersey

Sample Identification (ID) CLP ID Sample Date	T25TP9-SS2 B7PS9 4/26/2010	T3TP1-SS1 B7Q07 4/26/2010	RPD Criteria <75%	ABS Criteria <5xCRQL	T25TP9-SS5 B7PT2 5/3/2010	T6TP2-SS1 B7Q35 5/3/2010	RPD Criteria <75%	ABS Criteria <5xCRQL	T25TP9-SS3 B7PT0 4/28/2010	T7TP1-SS2 B7Q44 4/28/2010	RPD Criteria <75%	ABS Criteria <5xCRQL
Di-N-Octyl Phthalate	190 U	190 U	NC		190 U	190 U	NC		190 U	190 U	NC	
<b>Fluoranthene</b>	<b>70 J</b>	<b>22 J</b>	<b>104.3</b>		32 J	27 J	16.9		190 U	38 J		152.0
Fluorene	190 U	190 U	NC		190 U	190 U	NC		190 U	190 U	NC	
Hexachlorobenzene	190 U	190 U	NC		190 U	190 U	NC		190 U	190 U	NC	
Hexachlorobutadiene	45 U	45 U	NC		46 U	45 U	NC		44 U	46 U	NC	
Hexachlorocyclopentadiene	190 U	190 U	NC		190 U	190 U	NC		190 U	190 U	NC	
Hexachloroethane	190 U	190 U	NC		190 U	190 U	NC		190 U	190 U	NC	
Indeno(1,2,3-Cd)Pyrene	31 J	170 U		139.0	170 U	170 U	NC		160 U	29 J		131.0
Isophorone	190 U	190 U	NC		190 U	190 U	NC		190 U	190 U	NC	
Naphthalene	190 U	190 U	NC		190 U	190 U	NC		190 U	190 U	NC	
Nitrobenzene	190 U	190 U	NC		190 U	190 U	NC		190 U	190 U	NC	
N-Nitroso-Di-N-Propylamine	77 U	77 U	NC		79 U	78 U	NC		75 U	79 U	NC	
N-Nitrosodiphenylamine	190 U	190 U	NC		190 U	190 U	NC		190 U	190 U	NC	
Pentachlorophenol	130 UJ	130 U	NC		140 U	140 U	NC		130 U	140 U	NC	
Phenanthrene	57 J	190 U		133.0	190 U	190 U	NC		190 U	190 U	NC	
Phenol	190 U	190 U	NC		190 U	190 U	NC		190 U	190 U	NC	
<b>Pyrene</b>	<b>98 J</b>	<b>31 J</b>	<b>103.9</b>		49 J	39 J	22.7		190 U	51 J		139.0
<b>SIM SVOCs (µg/kg)</b>												
2-Methylnaphthalene	4.9	2.7 J	57.9		6.2	3.1 J	66.7		3.6 U	3.9		0.3
Acenaphthene	4.7	3.7 U		1.0	2.7 J	3.7 U		1.0	3.6 U	3.8 U	NC	
<b>Acenaphthylene</b>	<b>6.1</b>	<b>2.2 J</b>	<b>94.0</b>		4.5	4.1	9.3		3.6 U	2.7 J		0.9
<b>Anthracene</b>	<b>7.5</b>	<b>2.6 J</b>	<b>97.0</b>		4.5	3.2 J	33.8		3.6 U	3.6 J		0.0
<b>Benzo(a)anthracene</b>	44	20	75.0		46 J	38 J	19.0		<b>2.7 J</b>	<b>27 J</b>	<b>163.6</b>	
<b>Benzo(a)pyrene</b>	<b>55 J</b>	<b>19</b>	<b>97.3</b>		52 J	43 J	18.9		3.6 U	29 J		25.4
<b>Benzo(b)fluoranthene</b>	43	23	60.6		43	51 J	17.0		<b>4.1</b>	<b>49</b>	<b>169.1</b>	
<b>Benzo(g,h,i)perylene</b>	35 J	19	59.3		29 J	26 J	10.9		<b>4.5</b>	<b>23 J</b>	<b>134.5</b>	
<b>Benzo(k)fluoranthene</b>	28 J	13 J	73.2		33 J	28 J	16.4		<b>2.5 J</b>	<b>22 J</b>	<b>159.2</b>	
<b>Chrysene</b>	48	22	74.3		46 J	39 J	16.5		<b>2.9 J</b>	<b>40</b>	<b>173.0</b>	
Dibenzo(a,h)anthracene	12 J	8.9 J	29.7		12 J	11 J	8.7		3.6 U	8.3 J		4.7
<b>Fluoranthene</b>	<b>83</b>	<b>32</b>	<b>88.7</b>		51	43	17.0		<b>3.2 J</b>	<b>43</b>	<b>172.3</b>	
Fluorene	8.9	3.7 U		5.2	3.5 J	1.9 J	59.3		3.6 U	3.8 U	NC	
Indeno(1,2,3-Cd)Pyrene	42	25	50.7		38 J	35 J	8.2		5.6 J	47 J	157.4	
Naphthalene	5.6	3.4 J	48.9		4.1 U	3.7 U	NC		3.6 U	5.2		1.6
Pentachlorophenol	7.5 R	7.5 R	NC		7.7 R	7.5 R	NC		7.3 R	7.6 R	NC	
<b>Phenanthrene</b>	<b>71</b>	<b>15</b>	<b>130.2</b>		28 J	19 J	38.3		<b>2 J</b>	<b>23 J</b>	<b>168.0</b>	
<b>Pyrene</b>	<b>100</b>	<b>38</b>	<b>89.9</b>		65	55	16.7		<b>5.6</b>	<b>49</b>	<b>159.0</b>	
<b>Pesticides (µg/kg)</b>												
4,4'-DDD	3.7 R	3.6 R	NC		3.8 R	3.7 R	NC		3.5 R	3.7 UJ	NC	
4,4'-DDE	3.7 U	3.6 U	NC		3.8 U	3.7 UJ	NC		3.5 UJ	3.7 UJ	NC	
4,4'-DDT	3.7 U	3.6 U	NC		8.6 NJ	3.7 U		4.9	<b>3.5 UJ</b>	<b>24 NJ</b>		<b>20.5</b>
Aldrin	1.9 U	1.9 U	NC		1.9 U	1.9 UJ	NC		1.8 UJ	1.9 UJ	NC	
Alpha-Bhc	1.9 U	1.9 U	NC		1.9 U	1.9 U	NC		1.8 UJ	1.9 UJ	NC	
Alpha-Chlordane	1.9 U	1.9 U	NC		1.9 U	1.9 UJ	NC		1.8 UJ	1.9 UJ	NC	
Beta-Bhc	1.9 U	1.9 U	NC		1.9 U	1.9 UJ	NC		1.8 UJ	1.9 UJ	NC	
Chlorinated Camphene	120 U	120 U	NC		130 U	120 U	NC		120 UJ	130 UJ	NC	
Delta-BHC	1.9 U	1.9 U	NC		1.9 U	1.9 UJ	NC		1.8 UJ	1.9 UJ	NC	
Dieldrin	3.7 U	3.6 U	NC		1.5 J	3.7 U		2.2	3.5 UJ	13 J		9.5
Endosulfan I	1.9 R	1.9 R	NC		1.9 R	1.9 R	NC		1.8 R	9.1 NJ		7.3
<b>Endosulfan II</b>	3.7 U	3.6 U	NC		2.2 J	3.7 UJ		1.5	3.5 UJ	7.6 NJ		4.1
<b>Endosulfan Sulfate</b>	3.7 U	3.6 U	NC		3.8 U	3.7 UJ	NC		3.5 UJ	3.7 UJ	NC	
Endrin	3.7 U	3.6 U	NC		3.8 U	3.7 U	NC		3.5 UJ	3.7 UJ	NC	
<b>Endrin Aldehyde</b>	3.7 U	3.6 U	NC		3.8 U	3.7 UJ	NC		3.5 UJ	6.3 J		2.8
Endrin Ketone	3.7 U	3.6 U	NC		3.8 U	3.7 UJ	NC		3.5 UJ	3.7 UJ	NC	

Table 4  
Field Duplicate Results  
Raritan Slag Site  
Old Bridge/Sayerville, New Jersey

Sample Identification (ID) CLP ID Sample Date	T25TP9-SS2 B7PS9 4/26/2010	T3TP1-SS1 B7Q07 4/26/2010	RPD Criteria <75%	ABS Criteria <5xCRQL	T25TP9-SS5 B7PT2 5/3/2010	T6TP2-SS1 B7Q35 5/3/2010	RPD Criteria <75%	ABS Criteria <5xCRQL	T25TP9-SS3 B7PT0 4/28/2010	T7TP1-SS2 B7Q44 4/28/2010	RPD Criteria <75%	ABS Criteria <5xCRQL
Gamma-Bhc (Lindane)	1.9 U	1.9 U	NC		1.9 U	1.9 U	NC		1.8 UJ	1.9 UJ	NC	
Gamma-Chlordane	1.9 U	1.9 U	NC		3.2 NJ	1.9 UJ		1.3	1.8 UJ	24 JN		22.2
Heptachlor	1.9 U	1.9 U	NC		1.9 U	1.9 U	NC		1.8 UJ	1.9 UJ	NC	
Heptachlor Epoxide	1.9 U	1.9 U	NC		1.9 U	1.9 UJ	NC		1.8 UJ	1.9 UJ	NC	
Methoxychlor	19 U	19 U	NC		19 U	19 U	NC		18 UJ	19 UJ	NC	
PCBs (µg/kg)												
Aroclor 1016	1.9 U	1.9 U	NC		1.9 U	1.9 U	NC		1.9 U	1.9 U	NC	
Aroclor 1221	1.9 U	1.9 U	NC		1.9 U	1.9 U	NC		1.9 U	1.9 U	NC	
Aroclor 1232	1.9 U	1.9 U	NC		1.9 U	1.9 U	NC		1.9 U	1.9 U	NC	
Aroclor 1242	1.9 U	1.9 U	NC		1.9 U	1.9 U	NC		1.9 U	1.9 U	NC	
Aroclor 1248	1.9 U	1.9 U	NC		1.9 U	1.9 U	NC		1.9 U	1.9 U	NC	
Aroclor 1254	54	74	31.3		3.6 J	7 J	64.2		3.3	170	192.4	
Aroclor 1260	1.9 U	1.9 U	NC		1.9 U	1.9 U	NC		1.9 U	1.9 U	NC	
Aroclor 1262	1.9 U	1.9 U	NC		1.9 U	1.9 U	NC		1.9 U	1.9 U	NC	
Aroclor 1268	1.9 U	1.9 U	NC		1.9 U	1.9 U	NC		1.9 U	1.9 U	NC	
Metals (mg/kg)												
Aluminum	2070	2460	17.2		2040	1280	45.8		1960	2370	18.9	
Antimony	53.3	35	41.4		1	2.7	91.9		0.33	0.33	0.0	
Arsenic	21.4	25	15.5		3.8	3.6	5.4		2.2	2	9.5	
Barium	144	54.9	89.6		9	7.5	18.2		9.9	10.1	2.0	
Beryllium	0.2	0.25	22.2		0.18	0.56	102.7		0.12	0.39	105.9	
Cadmium	0.37	0.47	23.8		0.074	0.061	19.3		0.094	0.086	8.9	
Calcium	542	573	5.6		501	560	11.1		524	527	0.6	
Chromium	10.5	13.4	24.3		6.9	6.2	10.7		5	5	0.0	
Chromium (Hexavalent Compounds)	1.2 UJ	1.2 UJ	NC		1.1	1.1	0.0		1.1 UJ	1.1 UJ	NC	
Cobalt	1.6	1.6	0.0		0.65	0.75	14.3		0.84	0.65	25.5	
Copper	40.1	58.2	36.8		10	7.9	23.5		17.5	16.4	6.5	
Cyanide	1.4	1.4	0.0		1.4	1.4	0.0		1.4	1.3	7.4	
Iron	12200	15800	25.7		11600	8980	25.5		7810	22800	97.9	
Metals (mg/kg)												
Lead	1390	1020	30.7		33	70	71.8		12.9	14.3	10.3	
Magnesium	533	537	0.7		501	560	11.1		524	527	0.6	
Manganese	37.4	89.8	82.4	52.4	31.5	16.8	60.9		19.2	16.7	13.9	
Mercury	0.027	0.028	3.6		0.023	0.03	26.4		0.028	0.035	22.2	
Nickel	4.6	8.6	60.6		1.7	4.5	90.3	2.8	4.2	4.2	0.0	
Potassium	533	537	0.7		119	131	9.6		120	106	12.4	
Selenium	0.51	0.76	39.4		0.15	0.14	6.9		0.16	0.14	13.3	
Silver	1.1	1.1	0.0		1	1.1	9.5		0.082	0.19	79.4	0.1
Sodium	533	537	0.7		501	560	11.1		524	527	0.6	
Thallium	0.091	0.076	18.0		0.035	0.057	47.8		0.065	0.065	0.0	
Vanadium	19	18.7	1.6		12.6	12	4.9		10.7	10.9	1.9	
Zinc	26.6	44.2	49.7		13.7	9.6	35.2		10.2	13.3	26.4	

Notes:

- Absolute difference value (ABS) was calculated when duplicate pairs were detect for one sample and non-detect for the other.
- Qualifiers are as follows: U = non-detect; J = estimated; and R = rejected.
- Values bolded in red exceed either the relative percent difference (RPD) or ABS.

Acronyms:

ABS - absolute value

mg/kg - milligram per kilogram

SVOCs - semi-volatile organic compounds

CLP - Contract Laboratory Program

PCBs - polychlorinated biphenyls

VOCs - volatile organic compounds

CRQL - Contract Required Quantitation Limit

RPD - relative percent difference

ug/kg - microgram per kilogram

NC - not calculated

SIM - selective ion monitoring

**Table 5**  
**Summary of Qualified Rejected Results**  
**Raritan Slag Site**  
**Old Bridge/Sayerville, New Jersey**

Sample ID	Contaminant of Concern	Results	Units
T10TP1-SS1	4,4'-DDD	3.6 R	µg/kg
T10TP1-SS1	Endosulfan I	1.9 R	µg/kg
T10TP1-SS1	Pentachlorophenol	7.5 R	µg/kg
T10TP1-SS2	4,4'-DDD	3.6 R	µg/kg
T10TP1-SS2	Endosulfan I	1.9 R	µg/kg
T10TP1-SS2	Pentachlorophenol	7.4 R	µg/kg
T11TP1-SS1	4,4'-DDD	3.6 R	µg/kg
T11TP1-SS1	Endosulfan I	1.9 R	µg/kg
T11TP1-SS1	Pentachlorophenol	7.5 R	µg/kg
T11TP1-SS1	Antimony	0.38 R	mg/kg
T11TP1-SS2	4,4'-DDD	3.6 R	µg/kg
T11TP1-SS2	Endosulfan I	1.9 R	µg/kg
T11TP1-SS2	Pentachlorophenol	7.4 R	µg/kg
T11TP1-SS2	Antimony	0.15 R	mg/kg
T11TP2-SS1	4,4'-DDD	3.9 R	µg/kg
T11TP2-SS1	Endosulfan I	2 R	µg/kg
T11TP2-SS1	Pentachlorophenol	7.9 R	µg/kg
T11TP2-SS2	4,4'-DDD	3.8 R	µg/kg
T11TP2-SS2	Endosulfan I	1.9 R	µg/kg
T11TP2-SS2	Pentachlorophenol	7.6 R	µg/kg
T11TP3-SS1	4,4'-DDD	3.6 R	µg/kg
T11TP3-SS1	Endosulfan I	1.9 R	µg/kg
T11TP3-SS1	Pentachlorophenol	7.5 R	µg/kg
T11TP3-SS1	Copper	325 R	mg/kg
T11TP3-SS2	4,4'-DDD	3.7 R	µg/kg
T11TP3-SS2	Endosulfan I	1.9 R	µg/kg
T11TP3-SS2	Pentachlorophenol	7.4 R	µg/kg
T11TP4-SS1	4,4'-DDD	3.8 R	µg/kg
T11TP4-SS1	Endosulfan I	2 R	µg/kg
T11TP4-SS1	Pentachlorophenol	7.7 R	µg/kg
T11TP5-SS2	Endrin	4 R	µg/kg
T11TP5-SS2	4,4'-DDD	4 R	µg/kg
T11TP5-SS2	Endosulfan I	2 R	µg/kg
T11TP5-SS2	Pentachlorophenol	8.1 R	µg/kg
T12TP1-SS1	4,4'-DDD	3.8 R	µg/kg
T12TP1-SS1	Endosulfan I	2 R	µg/kg
T12TP1-SS1	Pentachlorophenol	7.8 R	µg/kg
T12TP1-SS1	Chromium	6.1 R	mg/kg
T12TP1-SS1	Vanadium	11.9 R	mg/kg
T12TP1-SS2	4,4'-DDD	3.6 R	µg/kg
T12TP1-SS2	Endosulfan I	1.9 R	µg/kg
T12TP1-SS2	Pentachlorophenol	7.6 R	µg/kg
T12TP1-SS2	Chromium	16.7 R	mg/kg
T12TP1-SS2	Vanadium	57.4 R	mg/kg
T12TP2-SS1	4,4'-DDD	3.5 R	µg/kg
T12TP2-SS1	Endosulfan I	1.8 R	µg/kg
T12TP2-SS1	Pentachlorophenol	7.3 R	µg/kg
T12TP2-SS1	Chromium	3.6 R	mg/kg
T12TP2-SS1	Vanadium	6.3 R	mg/kg
T12TP3-SS1	4,4'-DDD	3.6 R	µg/kg
T12TP3-SS1	Endosulfan I	1.9 R	µg/kg
T12TP3-SS1	Pentachlorophenol	7.4 R	µg/kg

**Table 5**  
**Summary of Qualified Rejected Results**  
**Raritan Slag Site**  
**Old Bridge/Sayerville, New Jersey**

Sample ID	Contaminant of Concern	Results	Units
T12TP3-SS1	Chromium	3.8 R	mg/kg
T12TP3-SS1	Vanadium	8.3 R	mg/kg
T1TP1-SS1	4,4'-DDD	4.1 R	µg/kg
T1TP1-SS1	Endosulfan I	2.1 R	µg/kg
T1TP1-SS1	Pentachlorophenol	8.5 R	µg/kg
T1TP1-SS1	Chromium	1.8 R	mg/kg
T1TP1-SS1	Vanadium	3.8 R	mg/kg
T1TP2-SS2	4,4'-DDD	3.9 R	µg/kg
T1TP2-SS2	Endosulfan I	2.1 R	µg/kg
T1TP2-SS2	Pentachlorophenol	8.2 R	µg/kg
T1TP2-SS2	Chromium	5.9 R	mg/kg
T1TP2-SS2	Vanadium	11 R	mg/kg
T1TP3-SS1	4,4'-DDD	3.6 R	µg/kg
T1TP3-SS1	Endosulfan I	1.9 R	µg/kg
T1TP3-SS1	Pentachlorophenol	7.4 R	µg/kg
T1TP3-SS1	Chromium	4.4 R	mg/kg
T1TP3-SS1	Vanadium	8.5 R	mg/kg
T1TP3-SS2	4,4'-DDD	3.8 R	µg/kg
T1TP3-SS2	Endosulfan I	2 R	µg/kg
T1TP3-SS2	Pentachlorophenol	7.9 R	µg/kg
T1TP3-SS2	Chromium	12.9 R	mg/kg
T1TP3-SS2	Vanadium	29.7 R	mg/kg
T25TP9-SS1	4,4'-DDD	3.9 R	µg/kg
T25TP9-SS1	Endosulfan I	2 R	µg/kg
T25TP9-SS1	Pentachlorophenol	8 R	µg/kg
T25TP9-SS1	Chromium	10.8 R	mg/kg
T25TP9-SS1	Vanadium	20 R	mg/kg
T25TP9-SS2	4,4'-DDD	3.7 R	µg/kg
T25TP9-SS2	Endosulfan I	1.9 R	µg/kg
T25TP9-SS2	Pentachlorophenol	7.5 R	µg/kg
T25TP9-SS2	Chromium	10.5 R	mg/kg
T25TP9-SS2	Vanadium	19 R	mg/kg
T25TP9-SS3	4,4'-DDD	3.5 R	µg/kg
T25TP9-SS3	Endosulfan I	1.8 R	µg/kg
T25TP9-SS3	Pentachlorophenol	7.3 R	µg/kg
T25TP9-SS3	Antimony	0.33 R	mg/kg
T25TP9-SS4	4,4'-DDD	3.6 R	µg/kg
T25TP9-SS4	Endosulfan I	1.9 R	µg/kg
T25TP9-SS4	Pentachlorophenol	7.4 R	µg/kg
T25TP9-SS5	4,4'-DDD	3.8 R	µg/kg
T25TP9-SS5	Endosulfan I	1.9 R	µg/kg
T25TP9-SS5	Pentachlorophenol	7.7 R	µg/kg

**Table 5**  
**Summary of Qualified Rejected Results**  
**Raritan Slag Site**  
**Old Bridge/Sayerville, New Jersey**

Sample ID	Contaminant of Concern	Results	Units
T25TP9-SS6	4,4'-DDD	3.7 R	µg/kg
T25TP9-SS6	Endosulfan I	1.9 R	µg/kg
T25TP9-SS6	Pentachlorophenol	7.5 R	µg/kg
T25TP9-SS6	Copper	43.5 R	mg/kg
T2TP1-SS1	4,4'-DDD	3.5 R	µg/kg
T2TP1-SS1	Endosulfan I	1.8 R	µg/kg
T2TP1-SS1	Pentachlorophenol	7.4 R	µg/kg
T2TP1-SS1	Chromium	3.3 R	mg/kg
T2TP1-SS1	Vanadium	5.8 R	mg/kg
T2TP2-SS2	4,4'-DDD	3.7 R	µg/kg
T2TP2-SS2	Endosulfan I	2 R	µg/kg
T2TP2-SS2	Pentachlorophenol	7.7 R	µg/kg
T2TP2-SS2	Chromium	11.2 R	mg/kg
T2TP2-SS2	Vanadium	25.4 R	mg/kg
T2TP2-SS3	4,4'-DDD	3.9 R	µg/kg
T2TP2-SS3	Endosulfan I	2 R	µg/kg
T2TP2-SS3	Pentachlorophenol	8.1 R	µg/kg
T2TP2-SS3	Chromium	9.7 R	mg/kg
T2TP2-SS3	Vanadium	23.1 R	mg/kg
T2TP2-SS4	4,4'-DDD	3.4 R	µg/kg
T2TP2-SS4	Endosulfan I	1.8 R	µg/kg
T2TP2-SS4	Pentachlorophenol	7.1 R	µg/kg
T2TP2-SS4	Chromium	5.3 R	mg/kg
T2TP2-SS4	Vanadium	8.5 R	mg/kg
T3TP1-SS1	4,4'-DDD	3.6 R	µg/kg
T3TP1-SS1	Endosulfan I	1.9 R	µg/kg
T3TP1-SS1	Pentachlorophenol	7.5 R	µg/kg
T3TP1-SS1	Chromium	13.4 R	mg/kg
T3TP1-SS1	Vanadium	18.7 R	mg/kg
T3TP1-SS2	4,4'-DDD	3.6 R	µg/kg
T3TP1-SS2	Endosulfan I	1.9 R	µg/kg
T3TP1-SS2	Pentachlorophenol	7.4 R	µg/kg
T3TP1-SS2	Chromium	6.3 R	mg/kg
T3TP1-SS2	Vanadium	11.5 R	mg/kg
T3TP1-SS3	4,4'-DDD	3.8 R	µg/kg
T3TP1-SS3	Endosulfan I	2 R	µg/kg
T3TP1-SS3	Pentachlorophenol	7.8 R	µg/kg
T3TP1-SS3	Chromium	4.1 R	mg/kg
T3TP1-SS3	Vanadium	8.7 R	mg/kg
T4TP1-SS1	4,4'-DDD	3.7 R	µg/kg
T4TP1-SS1	Endosulfan I	1.9 R	µg/kg
T4TP1-SS1	Pentachlorophenol	7.7 R	µg/kg
T4TP1-SS1	Chromium	6.8 R	mg/kg
T4TP1-SS1	Vanadium	11.8 R	mg/kg
T4TP1-SS2	4,4'-DDD	3.7 R	µg/kg
T4TP1-SS2	Endosulfan I	1.9 R	µg/kg
T4TP1-SS2	Pentachlorophenol	7.6 R	µg/kg
T4TP1-SS2	Chromium	4.9 R	mg/kg
T4TP1-SS2	Vanadium	9.8 R	mg/kg
T4TP2-SS1	4,4'-DDD	3.5 R	µg/kg
T4TP2-SS1	Endosulfan I	1.8 R	µg/kg
T4TP2-SS1	Pentachlorophenol	7.3 R	µg/kg

**Table 5**  
**Summary of Qualified Rejected Results**  
**Raritan Slag Site**  
**Old Bridge/Sayerville, New Jersey**

Sample ID	Contaminant of Concern	Results	Units
T4TP2-SS2	4,4'-DDD	4 R	µg/kg
T4TP2-SS2	Endosulfan I	2.1 R	µg/kg
T4TP2-SS2	Pentachlorophenol	8.2 R	µg/kg
T5TP1-SS1	4,4'-DDD	3.6 R	µg/kg
T5TP1-SS1	Endosulfan I	1.9 R	µg/kg
T5TP1-SS1	Pentachlorophenol	7.4 R	µg/kg
T5TP1-SS1	Antimony	2.2 R	mg/kg
T5TP1-SS2	4,4'-DDD	4 R	µg/kg
T5TP1-SS2	Endosulfan I	2.1 R	µg/kg
T5TP1-SS2	Pentachlorophenol	8.3 R	µg/kg
T5TP1-SS2	Antimony	0.16 R	mg/kg
T6TP1-SS1	4,4'-DDD	3.8 R	µg/kg
T6TP1-SS1	Endosulfan I	2 R	µg/kg
T6TP1-SS1	Pentachlorophenol	7.8 R	µg/kg
T6TP1-SS1	Antimony	6.8 R	mg/kg
T6TP1-SS2	4,4'-DDD	3.6 R	µg/kg
T6TP1-SS2	Endosulfan I	1.9 R	µg/kg
T6TP1-SS2	Pentachlorophenol	7.5 R	µg/kg
T6TP1-SS2	Antimony	28.6 R	mg/kg
T6TP2-SS1	4,4'-DDD	3.7 R	µg/kg
T6TP2-SS1	Endosulfan I	1.9 R	µg/kg
T6TP2-SS1	Pentachlorophenol	7.5 R	µg/kg
T6TP2-SS2	4,4'-DDD	3.5 R	µg/kg
T6TP2-SS2	Endosulfan I	1.8 R	µg/kg
T6TP2-SS2	Pentachlorophenol	7.1 R	µg/kg
T7TP1-SS1	4,4'-DDD	3.5 R	µg/kg
T7TP1-SS1	Endosulfan I	1.8 R	µg/kg
T7TP1-SS1	Pentachlorophenol	7.2 R	µg/kg
T7TP1-SS1	Antimony	0.15 R	mg/kg
T7TP1-SS2	Pentachlorophenol	7.6 R	µg/kg
T7TP1-SS2	Antimony	0.33 R	mg/kg
T8TP1-SS1	4,4'-DDD	3.5 R	µg/kg
T8TP1-SS1	Endosulfan I	1.8 R	µg/kg
T8TP1-SS1	Pentachlorophenol	7.3 R	µg/kg
T8TP1-SS1	Antimony	5.2 R	mg/kg
T8TP2-SS1	Endrin	3.5 R	µg/kg
T8TP2-SS1	4,4'-DDD	3.5 R	µg/kg
T8TP2-SS1	Endosulfan I	1.8 R	µg/kg
T8TP2-SS1	Pentachlorophenol	7.1 R	µg/kg
T8TP2-SS2	Endosulfan I	2 R	µg/kg
T8TP2-SS2	Pentachlorophenol	7.8 R	µg/kg
T8TP3-SS1	Pentachlorophenol	7.4 R	µg/kg
T8TP3-SS1	4,4'-DDD	3.6 R	µg/kg
T8TP3-SS1	Endosulfan I	1.9 R	µg/kg
T8TP3-SS2	Endrin	3.6 R	µg/kg
T8TP3-SS2	4,4'-DDD	3.6 R	µg/kg
T8TP3-SS2	Endosulfan I	1.9 R	µg/kg
T8TP3-SS2	Pentachlorophenol	7.4 R	µg/kg
T9TP1-SS1	4,4'-DDD	3.4 R	µg/kg
T9TP1-SS1	Endosulfan I	1.8 R	µg/kg
T9TP1-SS1	Pentachlorophenol	7 R	µg/kg
T9TP1-SS1	Antimony	0.88 R	mg/kg

**Table 5**  
**Summary of Qualified Rejected Results**  
**Raritan Slag Site**  
**Old Bridge/Sayerville, New Jersey**

Sample ID	Contaminant of Concern	Results	Units
T9TP2-SS1	4,4'-DDD	3.8 R	µg/kg
T9TP2-SS1	Endosulfan I	2 R	µg/kg
T9TP2-SS1	Pentachlorophenol	7.8 R	µg/kg
T9TP2-SS1	Antimony	43.1 R	mg/kg
T9TP2-SS2	4,4'-DDD	3.6 R	µg/kg
T9TP2-SS2	Endosulfan I	1.8 R	µg/kg
T9TP2-SS2	Pentachlorophenol	7.3 R	µg/kg
T9TP2-SS2	Antimony	151 R	mg/kg
Total Number of Rejections		206	

**Acronyms:**

ID - identification

mg/kg - milligram per kilogram

R - sample results rejected

µg/kg - microgram per kilogram

Table 6  
Test Excavation Data Summary  
Field Rinsate Results  
Raritan Slag Site  
Old Bridge/Sayerville, New Jersey

Sample Identification (ID) Contract Laboratory Program (CLP) ID Quality Control Sample Date	FB-042110 MB7PT4 Field Blank 4/21/2010
<b>Volatile Organic Compounds (VOCs) (µg/L)</b>	
1,1,1-Trichloroethane	5 UJ
1,1,2,2-Tetrachloroethane	5 UJ
1,1,2-Trichloro-1,2,2-trifluoroethane	5 UJ
1,1,2-Trichloroethane	5 U
1,1-Dichloroethane	5 U
1,1-Dichloroethene	5 U
1,2,3-Trichlorobenzene	5 U
1,2,4-Trichlorobenzene	5 U
1,2-Dibromo-3-chloropropane	5 UJ
1,2-Dibromoethane	5 UJ
1,2-Dichlorobenzene	5 U
1,2-Dichloroethane	5 UJ
1,2-Dichloropropane	5 U
1,3-Dichlorobenzene	5 U
1,4-Dichlorobenzene	5 U
1,4-Dioxane	100 U
2-Butanone	10 U
2-Hexanone	10 U
4-Methyl-2-Pentanone	10 U
Acetone	10 U
Benzene	5 U
Bromochloromethane	5 U
Bromodichloromethane	5 U
Bromoform	5 U
Bromomethane	5 U
Carbon Disulfide	5 U
Carbon tetrachloride	5 UJ
Chlorobenzene	5 U
Chloroethane	5 U
Chloroform	5 U
Chloromethane	5 U
cis-1,2-Dichloroethene	5 U
cis-1,3-Dichloropropene	5 U
Cyclohexane	5 U
Dibromochloromethane	5 U
Dichlorodifluoromethane	5 U
Ethylbenzene	5 U
Isopropylbenzene	5 U
m,p-Xylene	5 U
Methyl Acetate	5 UJ
Methyl tert-Butyl Ether	5 UJ
Methylcyclohexane	5 U
<b>Methylene chloride</b>	<b>4.6 J</b>
o-Xylene	5 U
Styrene	5 U
Tetrachloroethene	5 U
Toluene	5 U
trans-1,2-Dichloroethene	5 U
trans-1,3-Dichloropropene	5 U
Trichloroethene	5 U
Trichlorofluoromethane	5 UJ
Vinyl Chloride	5 U

Table 6  
Test Excavation Data Summary  
Field Rinsate Results  
Raritan Slag Site  
Old Bridge/Sayerville, New Jersey

Sample Identification (ID)	FB-042110
Contract Laboratory Program (CLP) ID	MB7PT4
Quality Control Sample Date	Field Blank 4/21/2010
<b>Semi-volatile Organic Compounds (SVOCs) (µg/L)</b>	
1,1'-Biphenyl	5 U
1,2,4,5-Tetrachlorobenzene	5 U
2,4,5-Trichlorophenol	5 U
2,4,6-Trichlorophenol	5 U
2,4-Dichlorophenol	5 U
2,4-Dimethylphenol	2 U
2,4-Dinitrophenol	2 U
2,4-Dinitrotoluene	2 U
2,6-Dinitrotoluene	5 U
2-Chloronaphthalene	2 UJ
2-Chlorophenol	5 U
2-Methylnaphthalene	5 UJ
2-Methylphenol	5 U
2-Nitroaniline	10 U
2-Nitrophenol	5 U
3,3'-Dichlorobenzidine	5 U
3-Nitroaniline	10 U
4,6-Dinitro-2-Methylphenol	4.2 U
4-Bromophenyl Phenyl Ether	5 UJ
4-Chloro-3-Methylphenol	5 U
4-Chloroaniline	5 U
4-Chlorophenyl Phenylether	5 UJ
4-Methylphenol	5 U
4-Nitroaniline	10 U
4-Nitrophenol	10 U
Acenaphthene	5 UJ
Acenaphthylene	5 UJ
Acetophenone	5 U
Anthracene	5 U
Atrazine	5 U
Benzaldehyde	5 U
Benzo(a)anthracene	4.5 U
Benzo(a)pyrene	2 U
Benzo(b)fluoranthene	4.5 U
Benzo(g,h,i)perylene	5 U
Benzo(k)fluoranthene	5 U
Bis(2-Chloroethoxy) methane	5 U
Bis(2-Chloroethyl) ether	5 U
<b>Bis(2-Ethylhexyl) phthalate</b>	<b>3.4 J</b>
Bis-Chloroisopropyl ether	5 U
Butylbenzylphthalate	5 U
Caprolactam	5 U
Carbazole	5 UJ
Chlorophenols	5 U
Chrysene	5 U
Dibenzo(a,h)anthracene	2 U
Dibenzofuran	5 UJ
Diethylphthalate	5 U
Dimethylphthalate	5 U
Di-N-Butylphthalate	4.5 U
Di-N-Octyl Phthalate	5 U
Fluoranthene	5 U
Fluorene	5 UJ
Hexachlorobenzene	5 U
Hexachlorobutadiene	2 U
Hexachlorocyclopentadiene	5 U
Hexachloroethane	5 U
Indeno(1,2,3-Cd)Pyrene	4.5 U
Isophorone	5 U
Naphthalene	5 UJ
Nitrobenzene	5 U
N-Nitroso-Di-N-Propylamine	2.1 U
N-Nitrosodiphenylamine	5 U
Pentachlorophenol	3.6 UJ
Phenanthrene	5 U
Phenol	5 U
Pyrene	5 U

Table 6  
Test Excavation Data Summary  
Field Rinsate Results  
Raritan Slag Site  
Old Bridge/Sayerville, New Jersey

Sample Identification (ID)	FB-042110
Contract Laboratory Program (CLP) ID	MB7PT4
Quality Control Sample	Field Blank
Date	4/21/2010
<b>Selective Ion Monitoring (SIM) SVOCs (µg/L)</b>	
2-Methylnaphthalene	0.1 U
Acenaphthene	0.1 U
Acenaphthylene	0.1 U
Anthracene	0.1 U
Benzo(a)anthracene	0.1 U
<b>Benzo(a)pyrene</b>	<b>0.17</b>
Benzo(b)fluoranthene	0.1 U
<b>Benzo(g,h,i)perylene</b>	<b>0.14</b>
Benzo(k)fluoranthene	0.1 U
Chrysene	0.1 U
<b>Dibenzo(a,h)anthracene</b>	<b>0.13 J</b>
Fluoranthene	0.1 U
Fluorene	0.1 U
<b>Indeno(1,2,3-Cd)Pyrene</b>	<b>0.15</b>
<b>Naphthalene</b>	<b>0.16</b>
<b>Pentachlorophenol</b>	<b>0.2 R</b>
Phenanthrene	0.1 U
Pyrene	0.1 U
<b>Pesticides (µg/L)</b>	
4,4'-DDD	0.1 UJ
4,4'-DDE	0.1 UJ
4,4'-DDT	0.1 UJ
Aldrin	0.05 UJ
Alpha-Bhc	0.05 UJ
Alpha-Chlordane	0.05 UJ
Beta-Bhc	0.05 UJ
Chlorinated Camphene	3.3 UJ
Delta-BHC	0.05 UJ
Dieldrin	0.1 UJ
Endosulfan I	0.05 UJ
Endosulfan II	0.1 UJ
Endosulfan Sulfate	0.1 UJ
Endrin	0.1 UJ
Endrin Aldehyde	0.1 UJ
Endrin Ketone	0.1 UJ
Gamma-Bhc (Lindane)	0.05 UJ
Gamma-Chlordane	0.05 UJ
Heptachlor	0.05 UJ
Heptachlor Epoxide	0.05 UJ
Methoxychlor	0.5 UJ
<b>Polychlorinated biphenyls (PCBs) (µg/L)</b>	
Aroclor 1260	0.1 UJ
Aroclor 1254	0.1 UJ
Aroclor 1268	0.1 UJ
Aroclor 1221	0.1 UJ
Aroclor 1232	0.1 UJ
Aroclor 1248	0.1 UJ
Aroclor 1016	0.1 UJ
Aroclor 1262	0.1 UJ
Aroclor 1242	0.1 UJ

Table 6  
Test Excavation Data Summary  
Field Rinsate Results  
Raritan Slag Site  
Old Bridge/Sayerville, New Jersey

Sample Identification (ID)	FB-042110
Contract Laboratory Program (CLP) ID	MB7PT4
Quality Control Sample	Field Blank
Date	4/21/2010
<b>Metals (µg/L)</b>	
Aluminum	200 U
Antimony	2 U
Arsenic	1 U
<b>Barium</b>	<b>0.17 J</b>
Beryllium	5 U
Cadmium	1 U
Calcium	5000 U
Chromium	2 U
Chromium (Hexavalent Compounds)	200 U
Cobalt	1 U
Copper	25 U
Cyanide	10 U
Iron	100 U
Lead	1 U
Magnesium	5000 U
Manganese	15 U
Mercury	0.2 U
Nickel	40 U
Potassium	5000 U
Selenium	5 U
Silver	10 U
<b>Sodium</b>	<b>444 J</b>
Thallium	1 U
Vanadium	5 U
Zinc	5.9 J

**Notes:**

µg/L - microgram per Liter

U - non-detect

J - estimated data due to exceeded quality control criteria

R - data is rejected due to exceeded quality control criteria

**Table 7**  
**Laboratory QLs Not Meeting PQLGs**  
**Raritan Slag Site**  
**Old Bridge/Sayerville, New Jersey**

Analytical Parameter (All units: µg/kg)	PAL / PQLG	SOM01.2 Low CRQL	Laboratory Achieved QL	Sample Reported QL*	Comments
2,4-dimethylphenol	10	170	33	33-41	via MA 1929.0
2,4-dinitrophenol	60.9	170	61	61-75	via MA 1929.0
2,6-dinitrotoluene	32.8	170	170	150-210	
2-chloronaphthalene	12.2	170	33	33-41	via MA 1929.0
4,6-dinitro-2-methylphenol	144	330	140	140-170	via MA 1929.0
Di-n-butylphthalate	150	170	150	150-180	via MA 1929.0
Hexachlorobutadiene	39.8	170	40	40-49	via MA 1929.0
N-Nitroso-di-n-propylamine	69.4	170	69	69-85	via MA 1929.0
Pentachlorophenol	119	6.7 SIM/ 130 Low	120	120-150	SIM results were rejected
PCBs	0.33	33	1.7	1.7-1.9	via MA 1930.0
Analytical Parameter (All units: mg/kg)	PAL / PQLG	ILM05.4 Low CRQL	Laboratory Reported QL	Sample Reported QL	Comments
Arsenic	0.39	1	0.39	0.39	via MA 1923.0
Barium	1.04	20	1.04	1	via MA 1923.0
Cadmium	0.002	0.5	0.02	0.02	via MA 1923.0
Cobalt	0.1	5	0.1	0.1-1	via MA 1923.0
Cyanide	1.3	2.5	1.3	1.2-1.6	via MA 1923.0
Mercury	0.0005	0.1	0.05	0.027-0.028	via MA 1923.0.
Selenium	0.03	3.5	0.1	0.1-prep blank	via MA 1923.0
Thallium	0.06	2.5	0.06	0.005-prep blank	via MA 1923.0; MDL is 0.005

**Notes:**

\* - Soil sample reporting levels are typically higher than the achievable limits due to exact weight of sample used and the moisture content of the soil.

Results are reported as dry weight.

**Acronyms:**

CRQL - Contract Required Quantitation Limit

PCBs - polychlorinated biphenyls

QL - quantitation limit

MA - Modified Analysis

PAL - Project Action Limit

PQLG - Project Quantitation Limit Goal

µg/kg - micrograms per kilogram

**Table 8**  
**Trench Soil Samples**  
**Completeness Report**  
**Raritan Slag Site**  
**Old Bridge/Sayerville, New Jersey**

Method	Analytical Parameter	Non-Detects	Hits	Rejects	Total	Estimated Hits	Percent Estimated (Hits Only)	Percent Rejected
SOM01.2	TCL VOCs	2640	0	0	2640	0	0.0	0.0
SOM01.2	TCL SVOCs	3301	120	0	3421	117	3.4	0.0
SOM01.2 SIM	SIM SVOCs	431	201	51	683	201	29.4	7.5
SOM01.2	TCL Pesticides	936	33	102	1071	22	2.1	9.5
SOM01.2	TCL PCBs	436	0	0	436	3	0.7	0.0
SW-846, 3060A/7	Hexavalent Chromium	35	0	0	35	0	0.0	0.0
ILM05.4	TAL Metals	372	369	53	794	411	51.8	6.7
Lloyd Kahn	TOC	0	7	0	7	7	100.0	0.0
9045D	pH	0	7	0	7	0	0.0	0.0
<b>Totals</b>		<b>8151</b>	<b>737</b>	<b>206</b>	<b>9094</b>	<b>761</b>	<b>8.4</b>	<b>2.3</b>

<b>Percent of all Data Rejected</b>	2.27	
<b>Percent of all SIM SVOCs Rejected</b>	7.5	(All pentachlorophenol)
<b>Percent of all TCL Pesticides Rejected</b>	9.5	(Mainly 4,4'-DDD and endsulfan I)
<b>Percent of all TAL Metals Rejected</b>	6.7	(Mainly vanadium, antimony, chromium, and copper)
<b>Percent of all Hits Estimated</b>	8.4	(Does not include estimated non-detect data)
<b>Percent complete (judged valid)</b>	97.73	(Includes all estimated data)

**Acronyms:**

TCL = total compound list  
CLP = contract laboratory program  
SIM = selective ion monitoring

TAL = target analyte list  
PCBs = polychlorinated biphenyls  
TOC = total organic carbon

SVOCs = semi-volatile organic compounds  
VOCs = volatile organic compounds

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**Inorganic Data Review Narrative**

Case# 40054	Site: RARITAN BAY SLAG	Soil: 19
SDG# MB7PS8	Lab: CHEMTECH	Water: 1
Sampling Team: CDM	Reviewer: C. STANCA	Other: 0

**A.2.1 Data Validation Flags:**

The following flags may have been applied in red by the data validator and must be considered by the data user.

J - This flag indicates the result qualified as estimated

R and Red-Line - A red-line drawn through a sample result indicates unusable value. The red-lined data are known to contain significant errors based on documented information and must not be used by the data user.

U - This data validation qualifier is applied to sample results  $\geq$  MDL when associated blank is contaminated

Fully Usable Data - The results that do not carry "J" or "red-line" are fully usable.

**A.2.2 Laboratory Qualifiers:**

The CLP laboratory applies a contractual qualifier on all Form I's and the QC Form when a QC analysis is outside the control limits. These qualifiers are not applied on the Lotus or XLS spreadsheets. These qualifiers and their meanings are as follows:

N: This qualifier indicates the lack of accuracy in the reported result, and is applied when matrix spiked sample recovery is outside the control limits.

E: This qualifier indicates the presence of interference, and is applied when the ICP serial dilution is outside the control limits.

\*: This qualifier indicates the lack of precision, and is applied on Form I's and Form VI when the Lab Duplicate analysis is outside the control limits.

U: This is a concentration qualifier that laboratory applies to a non-detected result which is essentially less than the Method Detection Limit (MDL). A non-detected result of an analyte is indicated by the Contract Required Quantitation Limit (CRQL) of that analyte suffixed with "U".

J: This is also a concentration qualifier that laboratory applies to a positive result below the CRQL.

**NOTE:** The laboratory qualifiers are crossed out and replaced with the appropriate data validation qualifiers (J, R or U) by the data validator.

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**A.2.3.1    Data Case Description:**

This case consists of one (1) aqueous and nineteen (19) soil samples collected at the Raritan Bay Slag site between 4/21/10 and 4/26/10 for TAL Metals analysis according to the USEPA CLP SOW No. ILM05.4. Matrix spike, laboratory duplicate and serial dilution analyses were performed on sample MB7PZ6. The aqueous sample in this case was identified as field blank. Consequently, no matrix spike, laboratory duplicate or ICP serial dilution analyses were performed for the aqueous matrix.

As per EPA Technical Direction Form (TDF) only the following criteria were reviewed by the data validator, where applicable: Preservation, Holding Time, CRQL Standard, Matrix Spike (soil matrix), Interference Check Sample, Laboratory Duplicate, Field Duplicate, ICP Serial Dilution, and Field Blank. The qualifiers applied on Form Is and CADRE EXCEL spreadsheets are based on ESAT data review of the above mentioned criteria. For all other criteria see the CADRE Reports.

**A.2.3.2    CSF Audit:** No problems.

**A.2.3.3    Technical Review:**

**SDG MB7PS8 (SOIL + WATER, TAL METALS, ICP-AES)**

**ICB/CCB**

The Calibration Blanks values were  $\geq$ MDL but  $\leq$ CRQL for six analytes. (Only analytes that required qualifications were mentioned.) The following associated positive results  $\leq$ CRQL were raised to the CRQL and qualified "U".

"U" -> Be -> MB7PZ1, MB7PZ2, MB7PZ5, MB7PZ6, MB7PZ9, MB7Q04, MB7Q05

Ca -> MB7PT4, MB7PT5, MB7PW0, MB7PW3, MB7PZ1, MB7PZ2, MB7PZ5, MB7PZ6,  
MB7PZ9, MB7Q04, MB7Q05, MB7Q06, MB7Q08, MB7Q09, MB7Q15, MB7Q16

Mg -> MB7PS9, MB7PT5, MB7PW0, MB7PW3, MB7PZ1, MB7PZ2, MB7PZ5, MB7PZ6,  
MB7PZ9, MB7Q04, MB7Q05, MB7Q06, MB7Q07, MB7Q08, MB7Q09, MB7Q15,  
MB7Q16

Mn -> MB7PT4

Ni -> MB7PT4, MB7PT5, MB7PW0, MB7PW3, MB7PZ1, MB7PZ2, MB7PZ5, MB7PZ6,  
MB7PZ9, MB7Q04, MB7Q05, MB7Q06, MB7Q08, MB7Q09, MB7Q15, MB7Q16

K -> MB7PS9, MB7PT5, MB7PW0, MB7PW3, MB7PZ1, MB7PZ2, MB7PZ5, MB7PZ6,  
MB7PZ9, MB7Q04, MB7Q05, MB7Q06, MB7Q07, MB7Q08, MB7Q09, MB7Q15,  
MB7Q16

Ag -> MB7PS9, MB7PZ1, MB7PZ2, MB7PZ5, MB7PZ6, MB7PZ9, MB7Q07, MB7Q15,  
MB7Q16

**PREPARATION BLANK**

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The Preparation Blank values were  $\geq$ MDL but  $\leq$ CRQL for three analytes. (Only analytes that required qualifications were mentioned.) The associated positive results  $\leq$ CRQL were raised to the CRQL and qualified "U".

"U" -> Ca\* -> MB7PT4, MB7PT5, MB7PW0, MB7PW3, MB7PZ1, MB7PZ2, MB7PZ5, MB7PZ6, MB7PZ9, MB7Q04, MB7Q05, MB7Q06, MB7Q08, MB7Q09, MB7Q15, MB7Q16

Mn\* -> MB7PT4

Na -> MB7PS8, MB7PS9, MB7PT5, MB7PW0, MB7PW3, MB7PW4, MB7PZ1, MB7PZ2, MB7PZ5, MB7PZ6, MB7PZ9, MB7Q04, MB7Q05, MB7Q06, MB7Q07, MB7Q08, MB7Q09, MB7Q15, MB7Q16

### LABORATORY DUPLICATE

The RPD between sample and duplicate results was  $\geq$  35% but less than 120% for Al, Fe, and Mn when both sample and duplicate results were greater than 5 X CRQL. All associated sample results greater or equal to CRQL have been considered estimated and flagged "J". Only samples whose percent solids are within  $\pm$  10% of the percent solids of the sample used for laboratory duplicate analysis were affected.

"J" -> Al, Fe, Mn -> MB7PS8, MB7PS9, MB7PT5, MB7PW0, MB7PW3, MB7PW4, MB7PZ1, MB7PZ2, MB7PZ5, MB7PZ6, MB7PZ9, MB7Q04, MB7Q05, MB7Q06, MB7Q07, MB7Q08, MB7Q09, MB7Q15, MB7Q16

\* already qualified

**A.2.3.4**      Contract-Problem/Non-Compliance: None.

HWSS Reviewer: \_\_\_\_\_ Date: \_\_\_\_\_  
Signature

Contractor Reviewer: \_\_\_\_\_ Date: \_\_\_\_\_  
Signature

Verified by: \_\_\_\_\_ Date: \_\_\_\_\_  
Signature

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**Inorganic Data Review Narrative**

Case# 40054	Site: RARITAN BAY SLAG	Soil: 64
SDG# MB7PT0, MB7PT1, MB7PT4, MB7PX5	Lab: CHEMTECH	Water: 1
Sampling Team: CDM	Reviewer: C. STANCA	Other: 0

**A.2.1 Data Validation Flags:**

The following flags may have been applied in red by the data validator and must be considered by the data user.

J - This flag indicates the result qualified as estimated

R and Red-Line - A red-line drawn through a sample result indicates unusable value. The red-lined data are known to contain significant errors based on documented information and must not be used by the data user.

U - This data validation qualifier is applied to sample results  $\geq$  MDL when associated blank is contaminated

Fully Usable Data - The results that do not carry "J" or "red-line" are fully usable.

**A.2.2 Laboratory Qualifiers:**

The CLP laboratory applies a contractual qualifier on all Form I's and the QC Form when a QC analysis is outside the control limits. These qualifiers are not applied on the Lotus or XLS spreadsheets. These qualifiers and their meanings are as follows:

N: This qualifier indicates the lack of accuracy in the reported result, and is applied when matrix spiked sample recovery is outside the control limits.

E: This qualifier indicates the presence of interference, and is applied when the ICP serial dilution is outside the control limits.

\*: This qualifier indicates the lack of precision, and is applied on Form I's and Form VI when the Lab Duplicate analysis is outside the control limits.

U: This is a concentration qualifier that laboratory applies to a non-detected result which is essentially less than the Method Detection Limit (MDL). A non-detected result of an analyte is indicated by the Contract Required Quantitation Limit (CRQL) of that analyte suffixed with "U".

J: This is also a concentration qualifier that laboratory applies to a positive result below the CRQL.

**NOTE:** The laboratory qualifiers are crossed out and replaced with the appropriate data validation qualifiers (J, R or U) by the data validator.

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#### **A.2.3.1 Data Case Description:**

This case consists of one (1) aqueous and sixty-four (64) soil samples collected at the Raritan Bay Slag site between 4/21/10 and 5/04/10 for TAL Metals, Mercury, and Cyanide analysis according to the USEPA CLP SOW No. ILM05.4. Samples MB7PW7/MB7PT1, MB7PY3/MB7PT3, MB7Q35/MB7PT2, MB7PW4/MB7PS8, MB7Q07/MB7PS9, and MB7Q44/MB7PT0 were the field duplicate pairs for this sampling event. Matrix spike, laboratory duplicate and serial dilution analyses were performed on samples MB7Q20, MB7PZ6, and MB7Q32. The only aqueous sample in this case was identified as field blank. Consequently, no matrix spike, laboratory duplicate or ICP serial dilution analyses were performed for the aqueous matrix.

As per EPA Technical Direction Form (TDF) only the following criteria were reviewed by the data validator, where applicable: Preservation, Holding Time, CRQL Standard, Matrix Spike (soil matrix), Interference Check Sample, Laboratory Duplicate, Field Duplicate, ICP Serial Dilution, and Field Blank. The qualifiers applied on Form Is and CADRE EXCEL spreadsheets are based on ESAT data review of the above mentioned criteria. For all other criteria see the CADRE Reports.

**A.2.3.2 CSF Audit:** No problems.

#### **A.2.3.3 Technical Review:**

**SDG MB7PT1 (19 SOIL, TAL METALS, ICP-AES)**

ICB/CCB

The Calibration Blanks values were  $\geq$ MDL but  $\leq$ CRQL for seven analytes. (Only analytes that required qualifications were mentioned.) The following associated positive results  $\leq$ CRQL were raised to the CRQL and qualified "U".

"U" -> Be -> MB7PT3, MB7PX9, MB7PY0, MB7PY3, MB7PY4, MB7PY7, MB7PY8, MB7Q20, MB7Q35, MB7Q36, MB7Q55, MB7Q56, MB7Q59, MB7Q60

Ca -> MB7PT3, MB7PX9, MB7PY3, MB7PY4, MB7Q35, MB7Q56, MB7Q59, MB7Q60

Cu -> MB7Q20

Mg -> MB7PT1, MB7PT2, MB7PT3, MB7PW7, MB7PW8, MB7PX9, MB7PY0, MB7PY3, MB7PY4, MB7PY7, MB7PY8, MB7Q20, MB7Q35, MB7Q36, MB7Q55, MB7Q56, MB7Q59

Ni -> MB7PT3, MB7PX9, MB7PY0, MB7PY3, MB7PY4, MB7PY8, MB7Q35, MB7Q36, MB7Q56, MB7Q59, MB7Q60

Na -> MB7PT1, MB7PT2, MB7PT3, MB7PW7, MB7PW8, MB7PX9, MB7PY0, MB7PY3,

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MB7PY4, MB7PY7, MB7PY8, MB7Q19, MB7Q20, MB7Q35, MB7Q36, MB7Q55,  
MB7Q56, MB7Q59, MB7Q60

Zn -> MB7Q20, MB7Q55

### PREPARATION BLANK

The Preparation Blank values were  $\geq$ MDL but  $\leq$ CRQL for Ca and Na. (Only analytes that required qualifications were mentioned.) The associated positive results  $\leq$ CRQL were raised to the CRQL and qualified "U".

"U" -> Ca -> MB7PT1, MB7PT2, MB7PT3, MB7PW7, MB7PX9, MB7PY3, MB7PY4, MB7Q35,  
MB7Q56, MB7Q59, MB7Q60

Na -> MB7PT1, MB7PT2, MB7PT3, MB7PW7, MB7PW8, MB7PX9, MB7PY0, MB7PY3,  
MB7PY4, MB7PY7, MB7PY8, MB7Q19, MB7Q20, MB7Q35, MB7Q36, MB7Q55,  
MB7Q56, MB7Q59, MB7Q60

### LABORATORY DUPLICATE

The RPD between sample and duplicate results was  $\geq 35\%$  but less than 120% for Fe when both sample and duplicate results were greater than 5 X CRQL. All associated sample results greater or equal to CRQL have been considered estimated and flagged "J". Only samples whose percent solids are within  $\pm 10\%$  of the percent solids of the sample used for laboratory duplicate analysis were affected.

"J" -> Fe -> MB7PT1, MB7PT2, MB7PT3, MB7PW7, MB7PW8, MB7PX9, MB7PY0, MB7PY3,  
MB7PY4, MB7PY7, MB7PY8, MB7Q19, MB7Q20, MB7Q35, MB7Q36, MB7Q55,  
MB7Q56, MB7Q59, MB7Q60

### FIELD DUPLICATE

The RPD between sample and duplicate results was  $\geq 35\%$  but less than 120% for Fe, Mn, and Al and greater than 120% for Cu when both sample and duplicate results were greater than 5 X CRQL. All associated Al, Fe and Mn sample results greater or equal to CRQL have been considered estimated and flagged "J". All associated Cu results have been rejected.

"J" -> Fe\*, Mn -> MB7PT3, MB7PY3

Al, Mn -> MB7Q35, MB7PT2

"R" -> Cu -> MB7PT3, MB7PY3

SDG MB7PT4 (19 SOIL + 1 WATER, TAL METALS + Hg + CN, ICP-MS MA 1923.0)

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#### ICB/CCB

The Calibration Blanks values were  $\geq$ MDL but  $\leq$ CRQL for three analytes. (Only analytes that required qualifications were mentioned.) The following associated positive results  $\leq$ CRQL were raised to the CRQL and qualified "U".

"U" -> Sb -> MB7PT4, MB7PT5, MB7PZ6, MB7Q04, MB7Q09

Cd -> MB7PT4, MB7PT5

Tl -> MB7PT4, MB7PT5, MB7PW0, MB7PW3, MB7PZ1, MB7PZ2, MB7PZ5, MB7PZ6,  
MB7PZ9, MB7Q04, MB7Q05, MB7Q06, MB7Q08, MB7Q09, MB7Q15, MB7Q16

Pb -> MB7PT4

#### PREPARATION BLANK

The Preparation Blank values were  $\geq$ MDL but  $\leq$ CRQL for Sb. (Only analytes that required qualifications were mentioned.) The associated positive results  $\leq$ CRQL were raised to the CRQL and qualified "U".

"U" -> Sb\* -> MB7PT4, MB7PT5, MB7PZ6, MB7Q04, MB7Q09

#### MATRIX SPIKE

The matrix spike recovery was between 10 - 75% for Sb, As, Ba, Cd, Cr, Co, Se, and Tl and less than 10% for Cr and V. Only samples whose percent solids are within  $\pm$  10% of the percent solids of the sample used for matrix spike analysis were affected. The following results with concentration  $\leq$  4 X Spike Amount Added were considered estimated or rejected and qualified "J" or "R".

"J"-> Sb, As, Ba, Cd, Cr, Co, Se, Tl -> MB7PS8, MB7PS9, MB7PT5, MB7PW0,  
MB7PW3, MB7PW4, MB7PZ1, MB7PZ2,  
MB7PZ5, MB7PZ6, MB7PZ9, MB7Q04,  
MB7Q05, MB7Q06, MB7Q07, MB7Q08,  
MB7Q09, MB7Q15, MB7Q16

"R" -> Cr, V -> MB7PS8, MB7PS9, MB7PT5, MB7PW0, MB7PW3, MB7PW4, MB7PZ1,  
MB7PZ2, MB7PZ5, MB7PZ6, MB7PZ9, MB7Q04, MB7Q05, MB7Q06,  
MB7Q07, MB7Q08, MB7Q09, MB7Q15, MB7Q16

#### LABORATORY DUPLICATE

The RPD between sample and duplicate results was  $\geq$  35% but less than 120% for Ba when both sample and duplicate results were greater than 5 X CRQL. All associated sample results greater or equal to CRQL have been considered estimated and flagged "J". Only samples whose percent solids are within  $\pm$  10% of the percent solids of the sample used for laboratory duplicate analysis were affected.

"J" -> Ba\* -> MB7PS8, MB7PS9, MB7PT5, MB7PW0, MB7PW3, MB7PW4, MB7PZ1, MB7PZ2,  
MB7PZ5, MB7PZ6, MB7PZ9, MB7Q04, MB7Q05, MB7Q06, MB7Q07, MB7Q08,  
MB7Q09, MB7Q15, MB7Q16

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The absolute difference between sample and duplicate results was greater than 2X CRQL for As when sample and/or duplicate results were less than 5 X CRQL. All associated sample results were previously qualified. No action was taken.

#### FIELD DUPLICATE

The RPD between sample and duplicate results was  $\geq 35\%$  but less than 120% for V, Sb, and Ba when both sample and duplicate results were greater than 5 X CRQL. All associated sample results greater or equal to CRQL have been considered estimated and flagged "J".

"J" -> V\* -> MB7PW4, MB7PS8

Sb\*, Ba\* -> MB7Q07, MB7PS9

The absolute difference between sample and duplicate results was greater than 2X CRQL for Se when sample and/or duplicate results were less than 5 X CRQL. All associated sample results  $\leq 5 \times \text{CRQL}$  have been considered estimated and flagged "J".

"J" -> Se\* -> MB7Q07, MB7PS9

#### LABORATORY CONTROL SAMPLE

The LCS "Found" value for Pb was less than the lower control limit. All associated results have been considered estimated and flagged "J".

"J" -> Pb -> MB7PS8, MB7PS9, MB7PT5, MB7PW0, MB7PW3, MB7PW4, MB7PZ1, MB7PZ2, MB7PZ5, MB7PZ6, MB7PZ9, MB7Q04, MB7Q05, MB7Q06, MB7Q07, MB7Q08, MB7Q09, MB7Q15, MB7Q16

#### ICP SERIAL DILUTION

The ICP serial dilution analysis yielded percent differences greater than 10 but less than 100 when the initial concentration was equal to or greater than 50 X MDL for Co. All associated detects have been considered estimated and flagged "J".

"J" -> Co\* -> MB7PS8, MB7PS9, MB7PT5, MB7PW0, MB7PW3, MB7PW4, MB7PZ1, MB7PZ2, MB7PZ5, MB7PZ6, MB7PZ9, MB7Q04, MB7Q05, MB7Q06, MB7Q07, MB7Q08, MB7Q09, MB7Q15, MB7Q16

**SDG MB7PX5 (13 SOIL, TAL METALS + Hg + CN, ICP-MS MA 1923.0)**

ICB/CCB

## Standard Operating Procedure

USEPA Region 2

### Evaluation of Metals Data for the Contract Laboratory Program Data Assessment and Contract Compliance Review

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Sept. 2005

The Calibration Blanks values were  $\geq$ MDL but  $\leq$ CRQL for Sb and Tl. (Only analytes that required qualifications were mentioned.) The following associated positive results  $\leq$ CRQL were raised to the CRQL and qualified "U".

"U" -> Sb -> MB7PX6, MB7Q24

Tl -> MB7PT0, MB7PX5, MB7PX6, MB7Q23, MB7Q24, MB7Q32, MB7Q43, MB7Q44,  
MB7Q51

#### PREPARATION BLANK

The Preparation Blank values were  $\geq$ MDL but  $\leq$ CRQL for Sb and Tl. (Only analytes that required qualifications were mentioned.) The associated positive results  $\leq$ CRQL were raised to the CRQL and qualified "U".

"U" -> Sb\* -> MB7PX6, MB7Q24

Tl\* -> MB7PT0, MB7PX5, MB7PX6, MB7Q23, MB7Q24, MB7Q32, MB7Q43, MB7Q44,  
MB7Q51

#### MATRIX SPIKE

The matrix spike recovery was between 10 - 75% for Se and less than 10 for Sb. Only samples whose percent solids are within  $\pm$  10% of the percent solids of the sample used for matrix spike analysis were affected. The results with concentration  $\leq$  4 X Spike Amount Added were considered estimated and qualified "J".

"J" -> Se -> MB7PT0, MB7PX5, MB7PX6, MB7Q23, MB7Q24, MB7Q31, MB7Q32, MB7Q43,  
MB7Q44, MB7Q51, MB7Q63, MB7Q67, MB7Q68

"R" -> Sb -> MB7PT0, MB7PX5, MB7PX6, MB7Q23, MB7Q24, MB7Q31, MB7Q32, MB7Q43,  
MB7Q44, MB7Q51, MB7Q63, MB7Q67, MB7Q68

#### LABORATORY DUPLICATE

The RPD between sample and duplicate results was  $\geq$  35% but less than 120% for Sb, As, Co, and Pb when both sample and duplicate results were greater than 5 X CRQL. All associated sample results greater or equal to CRQL have been considered estimated and flagged "J". Only samples whose percent solids are within  $\pm$  10% of the percent solids of the sample used for laboratory duplicate analysis were affected.

"J" -> As, Co, Pb -> MB7PT0, MB7PX5, MB7PX6, MB7Q23, MB7Q24, MB7Q31, MB7Q32,  
MB7Q43, MB7Q44, MB7Q51, MB7Q63, MB7Q67, MB7Q68

Sb\* -> MB7PT0, MB7PX5, MB7Q23, MB7Q31, MB7Q32, MB7Q43, MB7Q44, MB7Q51,  
MB7Q63, MB7Q67, MB7Q68

#### LABORATORY CONTROL SAMPLE

The LCS "Found" value for Pb was less than the lower control limit. All associated results have been considered estimated and flagged "J".

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"J" -> Pb\* -> MB7PT0, MB7PX5, MB7PX6, MB7Q23, MB7Q24, MB7Q31, MB7Q32, MB7Q43, MB7Q44, MB7Q51, MB7Q63, MB7Q67, MB7Q68

#### ICP SERIAL DILUTION

The ICP serial dilution analysis yielded percent differences greater than 10 but less than 100 when the initial concentration was equal to or greater than 50X MDL for Co. All associated detects have been considered estimated and flagged "J".

"J" -> Co\* -> MB7PT0, MB7PX5, MB7PX6, MB7Q23, MB7Q24, MB7Q31, MB7Q32, MB7Q43, MB7Q44, MB7Q51, MB7Q63, MB7Q67, MB7Q68

**SDG MB7PT0 (13 SOIL, TAL METALS, ICP-AES)**

#### ICB/CCB

The Calibration Blanks values were  $\geq$ MDL but  $\leq$ CRQL for three analytes. (Only analytes that required qualifications were mentioned.) The following associated positive results  $\leq$ CRQL were raised to the CRQL and qualified "U".

"U" -> Ca -> MB7PT0, MB7PX5, MB7PX6, MB7Q24, MB7Q31, MB7Q32, MB7Q43, MB7Q44  
Mg -> MB7PT0, MB7PX5, MB7PX6, MB7Q23, MB7Q24, MB7Q31, MB7Q32, MB7Q43, MB7Q44  
Ni -> MB7PT0, MB7PX5, MB7PX6, MB7Q23, MB7Q24, MB7Q31, MB7Q32, MB7Q43, MB7Q44

#### PREPARATION BLANK

The Preparation Blank values were  $\geq$ MDL but  $\leq$ CRQL for Ca and Na. (Only analytes that required qualifications were mentioned.) The associated positive results  $\leq$ CRQL were raised to the CRQL and qualified "U".

"U" -> Ca\* -> MB7PT0, MB7PX5, MB7PX6, MB7Q24, MB7Q31, MB7Q32, MB7Q43, MB7Q44  
Na -> MB7PT0, MB7PX5, MB7PX6, MB7Q23, MB7Q24, MB7Q31, MB7Q32, MB7Q43, MB7Q44, MB7Q51, MB7Q63, MB7Q67, MB7Q68

#### LABORATORY DUPLICATE

The absolute difference between sample and duplicate results was greater than 2X CRQL for Cu when sample and/or duplicate results were less than 5 X CRQL. All associated sample results  $\leq$ 5XCRQL have been considered estimated and flagged "J". Only samples whose percent solids are within  $\pm$  10% of the percent solids of the sample used for laboratory duplicate analysis were affected.

"J" -> Cu -> MB7PX5, MB7PX6, MB7Q24, MB7Q32, MB7Q43, MB7Q63

#### FIELD DUPLICATE

The RPD between sample and duplicate results was  $\geq$  35% but less than 120% for Fe when both sample and duplicate results were greater than 5 X CRQL. All associated Fe results greater or equal to CRQL have been considered estimated

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and flagged "J".

"J" -> Fe -> MB7Q44, MB7PT0

\* already qualified

**A.2.3.4**      Contract-Problem/Non-Compliance: None.

HWSS Reviewer: \_\_\_\_\_ Date: \_\_\_\_\_  
Signature

Contractor  
Reviewer: \_\_\_\_\_ Date: \_\_\_\_\_  
Signature

Verified by: \_\_\_\_\_ Date: \_\_\_\_\_  
Signature

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Sept. 2005

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**Inorganic Data Review Narrative**

Case# 40054	Site: RARITAN BAY SLAG	Soil: 19
SDG# MB7PW7	Lab: CHEMTECH	Water: 0
Sampling Team: CDM	Reviewer: C. STANCA	Other: 0

**A.2.1 Data Validation Flags:**

The following flags may have been applied in red by the data validator and must be considered by the data user.

J - This flag indicates the result qualified as estimated

R and Red-Line - A red-line drawn through a sample result indicates unusable value. The red-lined data are known to contain significant errors based on documented information and must not be used by the data user.

U - This data validation qualifier is applied to sample results  $\geq$  MDL when associated blank is contaminated

Fully Usable Data - The results that do not carry "J" or "red-line" are fully usable.

**A.2.2 Laboratory Qualifiers:**

The CLP laboratory applies a contractual qualifier on all Form I's and the QC Form when a QC analysis is outside the control limits. These qualifiers are not applied on the Lotus or XLS spreadsheets. These qualifiers and their meanings are as follows:

N: This qualifier indicates the lack of accuracy in the reported result, and is applied when matrix spiked sample recovery is outside the control limits.

E: This qualifier indicates the presence of interference, and is applied when the ICP serial dilution is outside the control limits.

\*: This qualifier indicates the lack of precision, and is applied on Form I's and Form VI when the Lab Duplicate analysis is outside the control limits.

U: This is a concentration qualifier that laboratory applies to a non-detected result which is essentially less than the Method Detection Limit (MDL). A non-detected result of an analyte is indicated by the Contract Required Quantitation Limit (CRQL) of that analyte suffixed with "U".

J: This is also a concentration qualifier that laboratory applies to a positive result below the CRQL.

**NOTE:** The laboratory qualifiers are crossed out and replaced with the appropriate data validation qualifiers (J, R or U) by the data validator.

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#### **A.2.3.1 Data Case Description:**

This case consists of nineteen (19) soil samples collected at the Raritan Bay Slag site between 4/30/10 and 5/05/10 for TAL Metals, Mercury, and Cyanide analysis according to the USEPA CLP SOW No. ILM05.4. Samples MB7PW7/MB7PT1, MB7Q35/MB7PT2, and MB7PY3/MB7PT3 were the field duplicate pairs for this sampling event. Matrix spike, laboratory duplicate and serial dilution analyses were performed on sample MB7Q20.

As per EPA Technical Direction Form (TDF) only the following criteria were reviewed by the data validator, where applicable: Preservation, Holding Time, CRQL Standard, Matrix Spike (soil matrix), Interference Check Sample, Laboratory Duplicate, Field Duplicate, ICP Serial Dilution, and Field Blank. The qualifiers applied on Form Is and CADRE EXCEL spreadsheets are based on ESAT data review of the above mentioned criteria. For all other criteria see the CADRE Reports.

**A.2.3.2 CSF Audit:** No problems.

#### **A.2.3.3 Technical Review:**

##### **SDG MB7PW7 (19 SOIL, TAL METALS + Hg + CN, ICP-MS MA 1923.0)**

#### **LABORATORY DUPLICATE**

The RPD between sample and duplicate results was  $\geq 35\%$  but less than 120% for Ba when both sample and duplicate results were greater than 5 X CRQL. All associated sample results greater or equal to CRQL have been considered estimated and flagged "J". Only samples whose percent solids are within  $\pm 10\%$  of the percent solids of the sample used for laboratory duplicate analysis were affected.

"J" -> Ba -> MB7PT1, MB7PT2, MB7PT3, MB7PW7, MB7PW8, MB7PX9, MB7PY0, MB7PY3, MB7PY4, MB7PY7, MB7PY8, MB7Q19, MB7Q20, MB7Q35, MB7Q36, MB7Q55, MB7Q56, MB7Q59, MB7Q60

#### **LABORATORY CONTROL SAMPLE**

The LCS "Found" value for Pb was less than the lower control limit. All associated results have been considered estimated and flagged "J".

"J" -> Pb -> MB7PT1, MB7PT2, MB7PT3, MB7PW7, MB7PW8, MB7PX9, MB7PY0, MB7PY3, MB7PY4, MB7PY7, MB7PY8, MB7Q19, MB7Q20, MB7Q35, MB7Q36, MB7Q55, MB7Q56, MB7Q59, MB7Q60

#### **FIELD DUPLICATE**

The RPD between sample and duplicate results was  $\geq 35\%$  but less than 120% for Sb, As, Ba, Co, and Pb when both sample and duplicate results were greater than 5 X CRQL. All associated sample results greater or equal to CRQL have

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been considered estimated and flagged "J".

"J" -> Sb, As, Ba\* -> MB7PW7, MB7PT1

Sb, Pb\* -> MB7Q35, MB7PT2

Sb, As, Co, Pb\* -> MB7PY3, MB7PT3

\* already qualified

#### A.2.3.4 Contract-Problem/Non-Compliance:

The CRQL values for non-detected Selenium results on three Form Is were reported as zero. The error was corrected by the validator.

HWSS Reviewer: \_\_\_\_\_ Date: \_\_\_\_\_  
Signature

Contractor  
Reviewer: \_\_\_\_\_ Date: \_\_\_\_\_  
Signature

Verified by: \_\_\_\_\_ Date: \_\_\_\_\_  
Signature

ATTACHMENT 1  
SOM01.2/Aroclors  
SOP NO. HW-37

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### Functional Guidelines for Evaluating Organic Analysis

CASE No.: 40054  
LABORATORY: A4  
SAMPLER: CDM

SDG No.: B7PT2  
SITE: RARITAN BAY SLAG  
ANALYSIS: PCB

#### DATA ASSESSMENT

The current SOP HW-37 (Revision 1) August 2007, USEPA Region II Data Validation SOP for Statement of Work SOM01.2 for evaluating organic data have been applied.

All data are valid and acceptable except those analytes rejected "R"(unusable). Due to the detection of QC problems, some analytes may have the "J" (estimated), "N"(presumptive evidence for the presence of the material), "U" (non-detect) or "JN" (presumptive evidence for the presence of the material at an estimated value) flag. All action is detailed on the attached sheets.

The "R" flag means that the associated value is unusable. In other words, significant data bias is evident and the reported analyte concentration is unreliable.

Reviewer's  
Signature: Shobitha Amin

Date: JUNE / 28 / 2010

Peer Reviewer's  
Signature: \_\_\_\_\_

Date: \_\_\_\_/\_\_\_\_/2010

Verified By: \_\_\_\_\_

Date: \_\_\_\_/\_\_\_\_/2010

SDG# B7PT2

**1. HOLDING TIME:**

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

No problems found for this qualification.

**2. SURROGATES**

All samples are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

No problems found for this qualification.

**3. MATRIX SPIKE/SPIKE DUPLICATE, MS/MSD:**

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for additional qualification of data.

AMS1-The relative percent difference (RPD) between the following aroclor matrix spike and matrix spike duplicate recoveries is outside criteria. Detected compounds are qualified J. Non detected compounds are not qualified.

-B7Q20, B7Q20MS, B7Q20MSD

- Aroclor-1016 B7Q20, B7Q20MS, B7Q20MSD

**4. Laboratory Control Samples (LCS):**

The LCSs data provides information on the accuracy of the analytical method and laboratory performance. If LCS recoveries fell outside of the acceptable limits, qualifications were applied to the associated samples and compounds as shown below.

No problems found for this qualification.

**5. BLANK CONTAMINATION:**

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the concentration of the analyte in the blank, the analytes are qualified as non-detects U.

The following analytes in the sample shown were qualified with "U" for these reasons:

- A) **Method blank contamination:**  
No problems found for this qualification.
- B) **Field or rinse blank contamination:**  
Not applicable.

**6. CALIBRATION:**

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

- A) **Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):**

For the PCB fraction, if %RSD exceeds 20% for all analytes and the two surrogates, qualify all associated positive results "J" and non-detects "UJ".

For opening CCV, or closing CCV that is used as an opening CCV for the next 12-hour period, if %D exceeds 15% for analytes and the two surrogates, qualify all associated positive results "J" and non-detects "UJ".

For closing CCV, if %D exceeds 50% for all analytes and the two surrogates, qualify all associated positive results "J" and non-detects "UJ".

No problems found for this qualification.

**7. COMPOUND IDENTIFICATION:**

- A) **PCB Fraction:**

The retention times of reported compounds must fall within the calculated retention time windows for the two chromatographic columns and a GC/MS confirmation is required if the concentration exceeds 10ng/ml in the final sample extract.

**Qualified J:**

ADL312-The following aroclor samples have percent differences between analyte results in the

ATTACHMENT 1  
SOM01.2/Aroclors  
SOP NO. HW-37

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range of 26-50%. Detected compounds are qualified J.  
- Aroclor-1254 B7PT2, B7PY3, B7Q35

8. **CONTRACT PROBLEMS NON-COMPLIANCE:** None.
9. **FIELD DOCUMENTATION:** No problems.
10. **OTHER PROBLEMS:**
11. **This package contains re-extracted, re-analyzed or dilution runs. Upon reviewing the QA results, the following Form 1(s) are identified NOT to be used.**  
  
B7PT3DL, B7PY3DL

ATTACHMENT 1

SOM01.2/Semivolatiles

SOP NO. HW-35/SVOA, Rev.1

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### Functional Guidelines for Evaluating Organic Analysis

CASE No.: 40054  
LABORATORY: A4  
SAMPLER: CDM

SDG No.: B7PT2  
SITE: Raritan Bay Slag  
ANALYSIS: BNA & BNA-SIM

#### DATA ASSESSMENT

The current SOP HW-35/SVOA (Revision 1) August 2007, USEPA Region II Data Validation SOP for Statement of Work SOM01.2 for evaluating organic data have been applied.

Data has been reviewed according to TDF specifications, the National Functional Guidelines Report # 3 and CCS Semi-Automated Screening Results Report.

Tentatively Identified Compounds (TICS) for BNA fraction are not validated. They are validated only at the specific request of the data user.

All data are valid and acceptable except those analytes rejected "R"(unusable). Due to the detection of QC problems, some analytes may have the "J" (estimated), "N" (presumptive evidence for the presence of the material), "U" (non-detect) or "JN" (presumptive evidence for the presence of the material at an estimated value) flag. All action is detailed on the attached sheets.

The "R" flag means that the associated value is unusable. In other words, significant data bias is evident and the reported analyte concentration is unreliable.

Reviewer's

Signature: Shobitha S Amin

Date: June / 28 / 2010

Peer Reviewer's

Signature: \_\_\_\_\_

Date: \_\_\_\_ / \_\_\_\_ / 2010

Verified By: \_\_\_\_\_

Date: \_\_\_\_ / \_\_\_\_ / 2010

**BNA & BNA-SIM:**

**SDG# B7PT2**

**1. HOLDING TIME:**

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

No problems found for this qualification as per NFG/ CCS reports.

**2. SURROGATES**

All samples are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

No problems found for this qualification as per NFG/ CCS reports.

**3. MATRIX SPIKE/SPIKE DUPLICATE, MS/MSD:**

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for additional qualification of data.

Not applicable.

**4. BLANK CONTAMINATION:**

Quality assurance (QA) blanks, i.e., method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. If the concentration of the analyte is less than 5 times the blank contaminant level (10 times for common contaminants), the analytes are qualified as non-detects, "U". The following analytes in the sample shown were qualified with "U" for these reasons:

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**SOM01.2/Semivolatiles**

**SOP NO. HW-35/SVOA, Rev.1**

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**A) Method blank contamination:**

No problems found for this qualification.

**B) Field or rinse blank contamination:**

BNA:

The following BNA samples have analyte concentrations reported below the CRQL or at levels less than 5 times the CRQL. The associated Field blank concentration is below the CRQL. Detected compounds have been reported at the CRQL and qualified U.

Bis (2-ethylhexyl) phthalate

B7PX9, B7PY0, B7PY3, B7PY4, B7PY8, B7Q55, B7Q60

BNA-SIM:

The following semi volatile SIM samples have analyte concentrations reported less than the CRQL. The associated Field blank concentration is greater than the CRQL. Reported sample concentrations have been elevated to the CRQL.

Naphthalene B7Q35, B7Q56

Benzo(a)pyrene B7PT2DL, B7PX9DL, B7Q35DL, B7Q36, B7Q55

Indeno(1,2,3-cd) pyrene, B7PY0, B7PY4, B7PY7, B7PY8, B7Q20

Dibenzo(a,h)anthracene B7P59, B7PT2DL, B7PT3, B7PX9DL, B7PY0, B7PY3, B7PY4, B7PY7, B7PY8, B7Q19, B7Q20, B7Q35DL, B7Q35, B7Q36, B7Q55, B7Q59, B7Q60, B7Q56DL

Benzo(g,h,i)perylene B7PT2DL, B7PX9DL, B7PY0, B7PY4, B7PY7, B7PY8, B7Q19, B7Q20, B7Q35DL, B7Q56DL

The following semi volatile SIM samples have analyte concentrations reported greater than the CRQL and less than Field blank contamination. The associated Field blank concentration is greater than the CRQL. Reported sample concentrations have been reported and qualified U.

Naphthalene B7PT2

Benzo(a)pyrene B7P59, B7PT3, B7PY3, B7Q59, B7Q56DL

Indeno(1,2,3-cd) pyrene B7P59, B7PT2DL, B7PX9DL, B7Q19, B7Q35DL, B7Q36, B7Q55, B7Q59, B7Q56DL, B7PY3

Dibenzo(a,h)anthracene B7PX9

Benzo(g,h,i)perylene B7P59, B7Q36, B7Q55, B7Q59

**C) Trip blank contamination for VOA aqueous samples:**

Not applicable.

**D) Storage Blank associated with VOA samples only:**

Not applicable.

**E) Tics "R" rejected:**

**R2-0003994**

Tentatively Identified Compounds (TICS) for BNA fraction are not validated. They are validated only at the specific request of the data user.

**5. MASS SPECTROMETER TUNING:**

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is (BFB) Bromofluorobenzene and for semi-volatiles Decafluorotriphenyl-phosphine (DFTPP).

If the mass calibration is in error, all associated data will be classified as unusable "R".

No problems found for this qualification.

**6. CALIBRATION:**

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

**A) Response Factor GC/MS:**

The response factor measures the instrument's response to specific chemical compounds. The response factor for the Target Compound List (TCL) must be  $\geq 0.05$ , and  $\geq 0.01$  for the twenty-five analytes with poor response in both the initial and continuing calibrations. A value  $< 0.05$ , or  $< 0.01$  for the poor performers indicates a serious detection and quantitation problem (poor sensitivity). Analytes detected in the sample will be qualified as estimated, "J". All non-detects for that compound will be rejected "R".

BNA:

No problems found for this qualification as per NFG/ CCS reports.

BNA\_SIM:

BC15-The following semivolatile samples are associated with an initial calibration with average relative response factors (mean RRFs) outside criteria. Detected compounds are qualified J. Non detected compounds are qualified R.

-B7P59, B7PT2, B7PT2DL, B7PT3, B7PX9, B7PX9DL, B7PY0, B7PY3, B7PY4, B7PY7, B7PY8, B7Q19, B7Q20, B7Q35, B7Q35DL, B7Q36, B7Q55, B7Q56, B7Q56DL, B7Q60, SBLK1X, SBLK1Z

- Pentachlorophenol SSTD0.17E

-B7P59, B7PT2, B7PT2DL, B7PT3, B7PX9, B7PX9DL, B7PY0, B7PY3, B7PY4, B7PY7, B7PY8,

B7Q19, B7Q20, B7Q35, B7Q35DL, B7Q36, B7Q55, B7Q56, B7Q56DL, B7Q60, SBLK1X, SBLK1Z

BC14-The following semivolatile samples are associated with a CCV with relative response factors (RRF50) outside criteria. Detected compounds are qualified J. Non detected compounds are qualified R.

-B7P59, B7PT2, B7PT2DL, B7PT3, B7PX9, B7PX9DL, B7PY0, B7PY3, B7PY4, B7PY7, B7PY8, B7Q35, B7Q35DL, B7Q36, B7Q55, B7Q56, B7Q56DL, B7Q60, SBLK1X, SBLK1Z

- **Pentachlorophenol** SSTD0.47K, SSTD0.47M

-B7P59, B7PT2, B7PT2DL, B7PT3, B7PX9, B7PX9DL, B7PY0, B7PY3, B7PY4, B7PY7, B7PY8, B7Q35, B7Q35DL, B7Q36, B7Q55, B7Q56, B7Q56DL, B7Q60, SBLK1X, SBLK1Z

**B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):**

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance. Percent RSD must be < 20%, and < 40% for the poor performers. % D must be < 25%, and < 40% for the poor performers. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and non-detects are flagged "UJ". If %RSD and %D grossly exceed QC criteria, non-detects data may be qualified "R".

The following analytes in the sample shown were qualified for %RSD and %D:

**BNA:**

BC5-The following semivolatile samples are associated with an initial calibration percent relative standard deviation (%RSD) outside criteria. Detected compounds are qualified J. Non detected compounds are not qualified.

-B7PT2, B7PT3, B7PX9, B7PY0, B7PY3, B7PY4, B7PY7, B7PY8, B7Q19, B7Q20, B7Q35, B7Q36, B7Q55, B7Q56, B7Q59, B7Q60, SBLK1W, SBLK1Y

- **Benzo (b) fluoranthene** SSTD0021R

-B7PT2, B7Q19, B7Q20, B7Q35, B7Q36, SBLK1W

- **Benzo (k) fluoranthene** SSTD0021R

-B7PT2, B7Q19, B7Q20, B7Q35, B7Q36, SBLK1W

- **2,3,4,6-Tetrachlorophenol** SSTD0021R

-B7PT2, B7Q19, B7Q20, B7Q35, B7Q36, SBLK1W

- **Pentachlorophenol** SSTD0021R, SSTD0022C

-B7PT2, B7PT3, B7PX9, B7PY0, B7PY3, B7PY4, B7PY7, B7PY8, B7Q19, B7Q20, B7Q35, B7Q36, B7Q55, B7Q56, B7Q59, B7Q60, SBLK1W, SBLK1Y

#### **BNA-SIM**

BC5-The following semivolatile samples are associated with an initial calibration percent relative standard deviation (%RSD) outside criteria. Detected compounds are qualified J. Non detected compounds are not qualified.

-B7P59, B7PT2, B7PT2DL, B7PT3, B7PX9, B7PX9DL, B7PY0, B7PY3, B7PY4, B7PY7, B7PY8, B7Q19, B7Q20, B7Q35, B7Q35DL, B7Q36, B7Q55, B7Q56, B7Q56DL, B7Q60, SBLK1X, SBLK1Z

- **Dibenzo (a,h) anthracene** SSTD0.17E

-B7P59, B7PT2, B7PT2DL, B7PT3, B7PX9, B7PX9DL, B7PY0, B7PY3, B7PY4, B7PY7, B7PY8, B7Q19, B7Q20, B7Q35, B7Q35DL, B7Q36, B7Q55, B7Q56, B7Q56DL, B7Q60, SBLK1X, SBLK1Z

- **Pentachlorophenol** SSTD0.17E

-B7P59, B7PT2, B7PT2DL, B7PT3, B7PX9, B7PX9DL, B7PY0, B7PY3, B7PY4, B7PY7, B7PY8, B7Q19, B7Q20, B7Q35, B7Q35DL, B7Q36, B7Q55, B7Q56, B7Q56DL, B7Q60, SBLK1X, SBLK1Z

#### **BNA\_SIM**

The following semivolatile samples are associated with an opening or closing CCV percent difference (%D) outside criteria. Detected compounds are qualified J. Non detected compounds are qualified UJ.

-B7P59, B7PT3, B7PX9, B7PX9DL, B7PY0, B7PY3, B7PY4, B7PY7, B7PY8, B7Q55, B7Q56, B7Q56DL, B7Q60, SBLK1Z

- **Pentachlorophenol** SSTD0.47M

-B7P59, B7PT3, B7PX9, B7PX9DL, B7PY0, B7PY3, B7PY4, B7PY7, B7PY8, B7Q55, B7Q56, B7Q56DL, B7Q60, SBLK1Z

### **7. INTERNAL STANDARDS PERFORMANCE GC/MS:**

Internal standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must not vary by more than a factor of 2 (-50% to +100%) from the associated continuing calibration standard. The retention time of the internal standard must not vary more than 30 seconds from the associated continuing calibration standard. If the area count is outside the (-50% to +100%) range of the associated standard, all of the positive results for compounds quantitated using that IS are qualified as estimated, "J", and all non-detects as "UJ", or "R" if there is a severe loss of sensitivity.

If an internal standard retention time varies by more than 30 seconds, the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction.

No problems found for this qualification as per NFG/ CCS reports.

**8. COMPOUND IDENTIFICATION:**

**A) Semi-Volatile Fractions:**

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within 0.06 RRT units of the standard compound and have an ion spectra which has a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications.

No problems found for this qualification.

**9. CONTRACT PROBLEMS NON-COMPLIANCE:**

**10. FIELD DOCUMENTATION:** No problems.

**11. OTHER PROBLEMS:**

**Sample # B7PT2:**

Phenanthrene, Benzo(a)anthracene, Chrysene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno (1,2,3-cd)pyrene, Benzo (g,h,i) perylene have been qualified J as they are detected at levels over the calibration range. They are detected at levels below the CRQL in the dilution run and could not be reported.

**Sample # B7Q35:**

Phenanthrene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno (1,2,3-cd)pyrene, Benzo (g,h,i) perylene have been qualified J as they are detected at levels over the calibration range. They are detected at levels below the CRQL in the dilution run and could not be reported.

**Sample # B7Q56:**

Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno (1,2,3-cd)pyrene, Benzo (g,h,i) perylene have been qualified J as they are detected at levels over the calibration range. They are detected at levels below the CRQL in the dilution run and could not be reported.

**12. This package contains re-extracted, reanalyzed or dilution runs. Upon reviewing the QA results, the following Form 1(s) are identified NOT to be used.**

**ATTACHMENT 1**  
**SOM01.2/Semivolatiles**  
**SOP NO. HW-35/SVOA, Rev.1**

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**BNA:**

None.

**BNA-SIM:**

B7PT2DL, B7PX9DL, B7Q35DL, B7Q56DL

Functional Guidelines for Evaluating Organic Analysis

CASE No.: 40054  
LABORATORY: A4  
SAMPLER: CDM

SDG No.: B7PT2  
SITE: RARITAN BAY SLAG  
ANALYSIS: VOA

DATA ASSESSMENT

The current SOP HW-33/VOA (Revision 1) August 2007, USEPA Region II Data Validation SOP for Statement of Work SOM01.2 for evaluating organic data has been applied.

Data has been reviewed according to TDF specifications, the National Functional Guidelines Report # 3 and CCS Semi-Automated Screening Results Report.

Tentatively Identified Compounds (TICS) for VOA fraction are not validated. They are validated only at the specific request of the data user.

All data are valid and acceptable except those analytes rejected "R"(unusable). Due to the detection of QC problems, some analytes may have the "J" (estimated), "N"(presumptive evidence for the presence of the material), "U" (non-detect) or "JN" (presumptive evidence for the presence of the material at an estimated value) flag. All action is detailed on the attached sheets.

The "R" flag means that the associated value is unusable. In other words, significant data bias is evident and the reported analyte concentration is unreliable.

Reviewer's  
Signature: Shobitha Amin

Date: JUNE / 28 /2010

Peer Reviewer's  
Signature: \_\_\_\_\_

Date: \_\_\_\_\_ / \_\_\_\_\_ /2010

Verified By: \_\_\_\_\_

Date: \_\_\_\_\_ / \_\_\_\_\_ /2010

**SDG# B7PT2**

**1. HOLDING TIME:**

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

No problems found for this qualification as per NFG/CCS report.

**2. DMC's**

All samples are spiked with surrogate compounds (DMC's) prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

VDSS3-The following volatile samples have DMC/SMC recoveries above the upper limit of the criteria window. Detected compounds are qualified J. Nondetected compounds are not qualified.

- **Chloroethane-d5** B7PX9, B7PY3, B7PY7

-Bromomethane, Carbon disulfide, Chloroethane, Chloromethane, Dichlorodifluoromethane

- **Vinyl chloride-d3** B7PY7

-Vinyl chloride

VDSS4-The following volatile samples have one or more DMC/SMC recovery values is less than the primary lower limit but greater than or equal to the expanded lower limit of the criteria window. Detected compounds are qualified J. Nondetected compounds are qualified UJ.

-B7PT3, B7Q20MSD

- **1,2-Dichloroethane-d4** B7Q20MSD

-1,1,1-Trichloroethane, 1,1,2-Trichloro-1,2,2-trifluoroethane, 1,2-Dibromoethane, 1,2-Dichloroethane, Carbon tetrachloride, Methyl acetate, Methyl tert-butyl ether, Methylene chloride, Trichlorofluoromethane

- **Toluene-d8** B7PT3

-Ethylbenzene, Isopropylbenzene, Styrene, Tetrachloroethene, Toluene, Trichloroethene, m,p-Xylene, o-Xylene

**3. MATRIX SPIKE/SPIKE DUPLICATE, MS/MSD:**

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for additional qualification of data.

No problems found for this qualification.

**4. BLANK CONTAMINATION:**

Quality assurance (QA) blanks, i.e., method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. If the concentration of the analyte is less than 1 times the blank contaminant level (2 times for common contaminants), the analytes are qualified as non-detects, "U".

The following analytes in the sample shown were qualified with "U" for these reasons:

**A) Method blank contamination:**

No problems found for this qualification.

**B) Field/ Equipment or rinse blank contamination:**

No problems found for this qualification.

**C) Trip blank contamination for VOA aqueous samples:**

Not applicable.

**D) Storage Blank associated with VOA samples only:**

No problems found for this qualification.

**E) Tics "R" rejected:**

Tentatively Identified Compounds (TICS) for VOA fraction are not validated. They are validated at the specific request of the data user.

**5. MASS SPECTROMETER TUNING:**

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is (BFB) Bromofluorobenzene.

If the mass calibration is in error, all associated data will be classified as unusable "R".

No problems found for this qualification as per NFG/CCS report.

**6. CALIBRATION:**

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

**A) Response Factor GC/MS:**

The response factor measures the instrument's response to specific chemical compounds. The response factor for the Target Compound List (TCL) must be  $\geq 0.05$ , and  $\geq 0.01$  for the twenty-two analytes with poor response in both the initial and continuing calibrations. A value  $< 0.05$ , or  $< 0.01$  for the poor performers indicates a serious detection and quantitation problem (poor sensitivity). Analytes detected in the sample will be qualified as estimated, "J". All non-detects for that compound will be rejected "R".

No problems found for this qualification as per NFG/CCS report.

**B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):**

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance. Percent RSD must be  $< 20\%$ ,  $< 40\%$  for the poor performers, and  $< 50\%$  for 1,4-Dioxane. %D must be  $< 25\%$ ,  $< 40\%$  for the poor performers, and  $< 50\%$  for 1,4-Dioxane. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and non-detects are flagged "UJ". If %RSD and %D grossly exceed QC criteria ( $> 90\%$ ), non-detects data may be qualified "R".

The following analytes in the sample shown were qualified for %RSD and %D:

VC6-The following volatile samples are associated with an initial calibration percent relative standard deviation (%RSD) outside criteria. Detected compounds are qualified J. Non detected compounds are not qualified.

-B7PT2, B7PT3, B7PX9, B7PY0, B7PY3, B7PY4, B7PY7, B7PY8, B7Q19, B7Q20, B7Q20MS, B7Q20MSD, B7Q35, B7Q36, B7Q55, B7Q56, B7Q59, B7Q60, VBLK6J, VBLK6L, VBLK6N, VBLK6Y, VHBLK1A

- Bromomethane VSTD2.56D

- Vinyl Chloride VSTD2.56U

**7. INTERNAL STANDARDS PERFORMANCE GC/MS:**

Internal standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must not vary by more than a factor of 2 ( $-50\%$  to  $+200\%$ ) from the associated continuing calibration standard. The retention time of the internal standard must not vary more than 30 seconds from the associated continuing calibration standard. If the area count is outside the ( $-50\%$  to  $+200\%$ ) range of the associated standard, all of the positive results for compounds quantitated using that IS are qualified as estimated, "J", and all non-detects as "UJ", or "R" if there is a severe loss of sensitivity.

**ATTACHMENT 1**

**SOM01.2/Low/Med**

**SOP NO. HW-33/VOA, Rev.1**

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**If an internal standard retention time varies by more than 30 seconds, the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction.**

No problems found for this qualification as per NFG/CCS report.

**8. COMPOUND IDENTIFICATION:**

**A) Volatile Fraction:**

**TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within 0.06 RRT units of the standard compound and have ion spectra which has a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications.**

No problems found for this qualification as per NFG/CCS report.

**9. CONTRACT PROBLEMS NON-COMPLIANCE:**

**10. FIELD DOCUMENTATION:**

**11. OTHER PROBLEMS:**

**12. This package contains re-extracted, re-analyzed or diluted runs. Upon reviewing the QA results, the following Form 1(s) are identified NOT to be used.**

None.

ATTACHMENT 1  
SOM01.2/Aroclors  
SOP NO. HW-37

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### Functional Guidelines for Evaluating Organic Analysis

CASE No.: 40054  
LABORATORY: A4  
SAMPLER: CDM

SDG No.: B7PT4, B7Q32, B7PS8  
SITE: Raritan Bay Slag  
ANALYSIS: PCB

### DATA ASSESSMENT

The current SOP HW-37 (Revision 1) August 2007, USEPA Region II Data Validation SOP for Statement of Work SOM01.2 for evaluating organic data have been applied.

All data are valid and acceptable except those analytes rejected "R"(unusable). Due to the detection of QC problems, some analytes may have the "J" (estimated), "N"(presumptive evidence for the presence of the material), "U" (non-detect) or "JN" (presumptive evidence for the presence of the material at an estimated value) flag. All action is detailed on the attached sheets.

The "R" flag means that the associated value is unusable. In other words, significant data bias is evident and the reported analyte concentration is unreliable.

Reviewer's  
Signature: Dorina Christina Alliu

Date: July/14 /2010

Peer Reviewer's  
Signature: \_\_\_\_\_

Date: \_\_\_\_/\_\_\_\_/2010

Verified By: \_\_\_\_\_

Date: \_\_\_\_/\_\_\_\_/2010

SDG# B7PT4

**1. HOLDING TIME :**

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

The following pesticide water samples are outside primary extraction holding time criteria.  
Detected compounds are qualified J. Non-detected compounds are qualified UJ.

B7PT4

**2. SURROGATES**

All samples are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

No problems found for this qualification

**3. MATRIX SPIKE/SPIKE DUPLICATE, MS/MSD:**

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for additional qualification of data.

Not Applicable

**4. Laboratory Control Samples (LCS):**

The LCSs data provides information on the accuracy of the analytical method and laboratory performance. If LCS recoveries fell outside of the acceptable limits, qualifications were applied to the associated samples and compounds as shown below.

No problems found for this qualification

**5. BLANK CONTAMINATION:**

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the concentration of the analyte in the blank, the analytes are qualified as non-detects U.

The following analytes in the sample shown were qualified with "U" for these reasons:

**A) Method blank contamination:**

No problems found for this qualification.

**B) Field or rinse blank contamination:**

No problems found for this qualification sample was the field blank.

**6. CALIBRATION:**

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

**A) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):**

For the PCB fraction, if %RSD exceeds 20% for all analytes and the two surrogates, qualify all associated positive results "J" and non-detects "UJ".

For opening CCV, or closing CCV that is used as an opening CCV for the next 12-hour period, if %D exceeds 15% for analytes and the two surrogates, qualify all associated positive results "J" and non-detects "UJ".

For closing CCV, if %D exceeds 50% for all analytes and the two surrogates, qualify all associated positive results "J" and non-detects "UJ".

No problems found for this qualification.

**7. COMPOUND IDENTIFICATION:**

**A) PCB Fraction:**

The retention times of reported compounds must fall within the calculated retention time windows for the two chromatographic columns and a GC/MS confirmation is required if the concentration exceeds 10ng/ml in the final sample extract.

No problems found for this qualification.

ATTACHMENT 1  
SOM01.2/Aroclors  
SOP NO. HW-37

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8. **CONTRACT PROBLEMS NON-COMPLIANCE:** None.

9. **FIELD DOCUMENTATION:** No problems.

10. **OTHER PROBLEMS:**

None

11. **This package contains reextractions, reanalyses or dilutions. Upon reviewing the QA results, the following Form 1(s) are identified NOT to be used.**

None

SDG# B7Q32

**1. HOLDING TIME:**

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

No problems found for this qualification

**2. SURROGATES**

All samples are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

The following aroclor samples have surrogate percent recoveries which exceed 150% but are less than or equal to 200%. Detected compounds are qualified J. Non-detected compounds are not qualified.

**Tetrachloro-m-xylene** B7Q32MSD

Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254, Aroclor-1260, Aroclor-1262, Aroclor-1268

**3. MATRIX SPIKE/SPIKE DUPLICATE, MS/MSD:**

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for additional qualification of data.

The relative percent difference (RPD) between the following aroclor matrix spike and matrix spike duplicate recoveries is outside criteria. Detected compounds are qualified J. Non-detected compounds are not qualified.

**Aroclor-1016** B7Q32, B7Q32MS, B7Q32MSD

The following Aroclor matrix/matrix spike duplicate samples have percent recoveries that are greater than the upper acceptance limit. Detected compounds are qualified J. Non-detected compounds are not qualified.

**Aroclor-1260** B7Q32, B7Q32MS, B7Q32MSD

**Aroclor-1016** B7Q32, B7Q32MS, B7Q32MSD

**4. Laboratory Control Samples (LCS):**

The LCSs data provides information on the accuracy of the analytical method and laboratory performance. If LCS recoveries fell outside of the acceptable limits, qualifications were applied to the associated samples and compounds as shown below.

No problems found for this qualification

**5. BLANK CONTAMINATION:**

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the concentration of the analyte in the blank, the analytes are qualified as non-detects U.

The following analytes in the sample shown were qualified with "U" for these reasons:

**A) Method blank contamination:**

No problems found for this qualification.

**B) Field or rinse blank contamination:**

No problems found for this qualification.

**6. CALIBRATION:**

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

**A) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):**

For the PCB fraction, if %RSD exceeds 20% for all analytes and the two surrogates, qualify all associated positive results "J" and non-detects "UJ".

For opening CCV, or closing CCV that is used as an opening CCV for the next 12-hour period, if %D exceeds 15% for analytes and the two surrogates, qualify all associated positive results "J" and non-detects "UJ".

For closing CCV, if %D exceeds 50% for all analytes and the two surrogates, qualify all associated positive results "J" and non-detects "UJ".

No problems found for this qualification.

**7. COMPOUND IDENTIFICATION:**

**A) PCB Fraction:**

The retention times of reported compounds must fall within the calculated retention time windows for the two chromatographic columns and a GC/MS confirmation is required if the concentration exceeds 10ng/ml in the final sample extract.

The following aroclor samples have percent differences between analyte results in the range of 26-50%. Detected compounds are qualified J.

**Aroclor-1016** B7Q32MS

**8. CONTRACT PROBLEMS NON-COMPLIANCE:** None.

**9. FIELD DOCUMENTATION:** No problems.

**11. OTHER PROBLEMS:**

None

**11. This package contains reextractions, reanalyses or dilutions. Upon reviewing the QA results, the following Form 1(s) are identified NOT to be used.**

B7Q23DL, B7Q44DL

SDG# B7PS8

**1. HOLDING TIME :**

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

No problems found for this qualification

**2. SURROGATES**

All samples are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

No problems found for this qualification

**3. MATRIX SPIKE/SPIKE DUPLICATE, MS/MSD:**

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for additional qualification of data.

The relative percent difference (RPD) between the following aroclor matrix spike and matrix spike duplicate recoveries is outside criteria. Detected compounds are qualified J. Non-detected compounds are not qualified.

**Aroclor-1016** B7PZ6, B7PZ6MS, B7PZ6MSD

The following Aroclor matrix/matrix spike duplicate samples have percent recoveries that are greater than the upper acceptance limit. Detected compounds are qualified J. Non-detected compounds are not qualified.

**Aroclor-1260** B7PZ6, B7PZ6MS, B7PZ6MSD

**4. Laboratory Control Samples (LCS):**

The LCSs data provides information on the accuracy of the analytical method and laboratory performance. If LCS recoveries fell outside of the acceptable limits, qualifications were applied to the associated samples and compounds as shown below.

No problems found for this qualification

**5. BLANK CONTAMINATION:**

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the concentration of the analyte in the blank, the analytes are qualified as non-detects U.

The following analytes in the sample shown were qualified with "U" for these reasons:

**A) Method blank contamination:**

No problems found for this qualification.

**B) Field or rinse blank contamination:**

No problems found for this qualification.

**6. CALIBRATION:**

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

**A) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):**

For the PCB fraction, if %RSD exceeds 20% for all analytes and the two surrogates, qualify all associated positive results "J" and non-detects "UJ".

For opening CCV, or closing CCV that is used as an opening CCV for the next 12-hour period, if %D exceeds 15% for analytes and the two surrogates, qualify all associated positive results "J" and non-detects "UJ".

For closing CCV, if %D exceeds 50% for all analytes and the two surrogates, qualify all associated positive results "J" and non-detects "UJ".

No problems found for this qualification.

**7. COMPOUND IDENTIFICATION:**

**A) PCB Fraction:**

The retention times of reported compounds must fall within the calculated retention time windows for the two chromatographic columns and a GC/MS confirmation is required if the concentration exceeds 10ng/ml in the final sample extract.

No problems found for this qualification.

**8. CONTRACT PROBLEMS NON-COMPLIANCE:** None.

**9. FIELD DOCUMENTATION:** No problems.

**12. OTHER PROBLEMS:**

None

**11. This package contains reextractions, reanalyses or dilutions. Upon reviewing the QA results, the following Form 1(s) are identified NOT to be used.**

B7PS9DL, B7PZ5DL, B7Q06DL, B7Q07DL

Functional Guidelines for Evaluating Organic Analysis

CASE No.: 40054  
LABORATORY: A4  
SAMPLER: CDM

SDG No.: B7PT2  
SITE: RARITAN BAY SLAG  
ANALYSIS: PEST

DATA ASSESSMENT

The current SOP HW-36 (Revision 1) August 2007, USEPA Region II Data Validation SOP for Statement of Work SOM01.2 for evaluating organic data have been applied.

Data has been reviewed according to TDF Specifications, the National Function Guidelines Report # 3 and CCS Semi-Automated Screening Results Report.

All data are valid and acceptable except those analytes rejected "R"(unusable). Due to the detection of QC problems, some analytes may have the "J" (estimated), "N" (presumptive evidence for the presence of the material), "U" (non-detect) or "JN"(presumptive evidence for the presence of the material at an estimated value) flag. All action is detailed on the attached sheets.

The "R" flag means that the associated value is unusable. In other words, significant data bias is evident and the reported analyte concentration is unreliable.

Reviewer's

Signature: Shobitha Amin

Date: June / 28 / 2010

Peer Reviewer's

Signature: \_\_\_\_\_

Date: \_\_\_\_\_ / \_\_\_\_\_ / 2010

Verified By: \_\_\_\_\_

Date: \_\_\_\_\_ / \_\_\_\_\_ / 2010

SDG# B7PT2

**1. HOLDING TIME:**

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

No problems found for this qualification as per NFG/ CCS report.

**2. SURROGATES**

All samples are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

No problems found for this qualification as per NFG/ CCS report.

**3. MATRIX SPIKE/SPIKE DUPLICATE, MS/MSD:**

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for additional qualification of data.

PMS1-The relative percent difference (RPD) between the following pesticide matrix spike and matrix spike duplicate recoveries is outside criteria. Detected compounds are qualified J.  
Nondetected compounds are not qualified.

-B7Q20, B7Q20MS, B7Q20MSD

- Heptachlor B7Q20, B7Q20MS, B7Q20MSD

**4. LABORATORY CONTROL RECOVERY (LCS):**

The LCS data is generated to determine the long-term precision and accuracy of the analytical method. The LCS may be used in conjunction with other QC criteria for additional qualification of data.

No problems found for this qualification as per NFG/ CCS report.

**5. BLANK CONTAMINATION:**

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or

field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the concentration of the analyte in the blank, the analytes are qualified as non-detects, "U".

The following analytes in the sample shown were qualified "U" for these reasons:

A) **Method/Instrument blank contamination:**  
No problems found for this qualification.

B) **Field or rinse blank contamination:**  
Not applicable.

6. **CALIBRATION:**

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) **Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):**

For the PESTICIDE fraction, if %RSD exceeds 20% for all analytes except alpha-BHC and delta-BHC 25%, for the two surrogates and Toxaphene 30%, qualify all associated positive results "J" and non-detects are not qualified.

B) **The Percent Difference (%D) for each of the SCP and surrogate in the PEM used for CCV must be greater than or equal to-25% and less than or equal to 25.0%. The Percent Difference (%D) between the calibration Factor (CF) for each of the SCP and surrogate in the Calibration Verification Standard (CS3) and the mean calibration factor from the initial calibration must be greater than or equal to-20% and less than or equal to 20.0%. The Percent Difference not within limits, detected associated compounds are qualified "J" and non-detected associated compounds are qualified "UJ".**

The following analytes in the sample shown were qualified for %RSD and %D:

VC19-The following Pesticides samples are associated with an initial calibration in which an analyte exceeded percent relative standard deviation (%RSD) criteria. Detected compounds are qualified J and non detected compounds are not qualified.

- **Beta BHC, Methoxychlor**

B7PT2, B7PT3, B7PT3DL, B7PX9, B7PY0, B7PY3, B7PY4, B7PY7, B7PY8, B7Q19, B7Q20, B7Q20MS, B7Q20MSD, B7Q35, B7Q36, B7Q55, B7Q56, B7Q59, B7Q60, PBLKRO, PBLKRQ, PLCSRO, PLCSRQ

-

PSP28-The following pesticide samples are associated with a continuing PEM in which the percent resolution between two adjacent peaks did not meet the resolution criteria. Detected compounds are qualified JN. Non-detected compounds are qualified R.

-B7PT3DL, B7PY8, B7Q55, B7Q56, B7Q60

- **Endrin** PEMGQ
- B7PT3DL, B7PY8, B7Q55, B7Q56, B7Q60

The following pesticide samples are associated with a Resolution Check Mixture in which the percent resolution between two adjacent peaks in the primary column did not meet the resolution criteria of 80%. Detected compounds are qualified JN. Non-detected compounds are qualified R.

**4,4'-DDD, Endosulfan 1**

B7PT2, B7PT3, B7PT3DL, B7PX9, B7PY0, B7PY3, B7PY4, B7PY7, B7PY8, B7Q19, B7Q20, B7Q20MS, B7Q20MSD, B7Q35, B7Q36, B7Q55, B7Q56, B7Q59, B7Q60, PBLKRO, PBLKRQ, PLCSRO, PLCSRQ

**Pesticide Calibration Verification:**

The following pesticide samples are associated with an Individual Standard Mixture B - Calibration Verification in which the %D is greater than 20 % for the surrogate Tetrachloro-m-xylene. All associated detected compounds are qualified J. Non-detected compounds are qualified UJ.

**TCMX**

4,4'-DDE, Aldrin, Endosulfan II, Endosulfan sulfate, Endrin aldehyde, Endrin ketone, Heptachlor epoxide, alpha-Chlordane, beta-BHC, delta-BHC, gamma-Chlordane

B7PT3, B7PT3DL, B7PX9, B7PY0, B7PY3, B7PY4, B7PY7, B7PY8, B7Q20MS, B7Q20MSD, B7Q35, B7Q36, B7Q55, B7Q56, B7Q59, B7Q60, PBLKRQ, PLCSRQ

**7. COMPOUND IDENTIFICATION:**

**The retention times of reported compounds must fall within the calculated retention time windows for the two chromatographic columns and a GC/MS confirmation is required if the concentration exceeds 10ng/ml in the final sample extract.**

**QUALIFIED U:**

PDL332-The following pesticide samples have percent differences between analyte results exceeding 50% and the results are below CRQL. Detected compounds are qualified U. Nondetected compounds are not qualified. Reported sample concentrations have been elevated to the CRQL.

- B7PT2, B7PT3DL, B7PY3
- **Endosulfan sulfate** B7PT3DL
- **Endrin** B7PT3DL, B7PY3
- **Methoxychlor** B7PT3DL
- **4,4'-DDE** B7PT2, B7PT3DL
- **Endrin aldehyde** B7PT2

**QUALIFIED J:**

PDL312-The following pesticide samples have percent differences between analyte results in the

range of 26-50%. Detected compounds are qualified J.

-B7PT2, B7PT3, B7PT3DL, B7PX9, B7PY0, B7PY3, B7PY4, B7PY7, B7PY8, B7Q19, B7Q20, B7Q20MS, B7Q20MSD, B7Q35, B7Q36, B7Q55, B7Q56, B7Q59, B7Q60

- **Heptachlor epoxide** PLCSRO, PLCSRQ

- **Aldrin** B7Q20MS

- **4,4'-DDT** B7PT3, B7Q56

- **gamma-Chlordane** B7PT3DL, B7PY3

- **Dieldrin** B7PT2, B7PT3DL, B7PY3, B7Q20MS

- **Endrin** PLCSRO

- **4,4'-DDD** B7Q56

- **4,4'-DDE** B7Q56

**QUALIFIED NJ:**

PDL322-The following pesticide samples have percent differences between analyte results in the range of 51-100%. Detected compounds are qualified NJ.

-B7PT2, B7PT3, B7PT3DL, B7PY3

- **4,4'-DDT** B7PT2, B7PT3DL, B7PY3

- **gamma-Chlordane** B7PT2, B7PT3

- **Dieldrin** B7PT3

- **Endrin** B7PT3

- **4,4'-DDE** B7PT3, B7PY3

8. **CONTRACT PROBLEMS NON-COMPLIANCE:** No problems.

9. **FIELD DOCUMENTATION:** No problems.

10. **OTHER PROBLEMS:**

11. This package contains re- extractions, re-analyses or dilution runs. Upon reviewing the QA results, the following Form 1(s) are identified NOT to be used.

B7PT3DL

Functional Guidelines for Evaluating Organic Analysis

CASE No.: 40054  
LABORATORY: A4  
SAMPLER: CDM

SDG No.: B7PT4, B7Q32, B7PS8  
SITE: Raritan Bay Slag  
ANALYSIS: PEST

DATA ASSESSMENT

The current SOP HW-36 (Revision 1) August 2007, USEPA Region II Data Validation SOP for Statement of Work SOM01.2 for evaluating organic data have been applied.

Data has been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi- Automated Screening Results Report.

All data are valid and acceptable except those analytes rejected "R"(unusable). Due to the detection of QC problems, some analytes may have the "J" (estimated), "N" (presumptive evidence for the presence of the material), "U" (non-detect) or "JN"(presumptive evidence for the presence of the material at an estimated value) flag. All action is detailed on the attached sheets.

The "R" flag means that the associated value is unusable. In other words, significant data bias is evident and the reported analyte concentration is unreliable.

Reviewer's

Signature: Dorina Christina Alliu

Date: July/15/2010

Peer Reviewer's

Signature: \_\_\_\_\_

Date: \_\_\_\_ / \_\_\_\_ /2010

Verified By: \_\_\_\_\_

Date: \_\_\_\_ / \_\_\_\_ /2010

SDG# B7PT4

**1. HOLDING TIME:**

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

The following pesticide water samples are outside primary extraction holding time criteria.  
Detected compounds are qualified J. Non-detected compounds are qualified UJ.

B7PT4

**2. SURROGATES**

All samples are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

No problems found for this qualification

**3. MATRIX SPIKE/SPIKE DUPLICATE, MS/MSD:**

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for additional qualification of data.

Not Applicable

**4. LABORATORY CONTROL RECOVERY (LCS):**

The LCS data is generated to determine the long-term precision and accuracy of the analytical method. The LCS may be used in conjunction with other QC criteria for additional qualification of data.

No problems found for this qualification

**5. BLANK CONTAMINATION:**

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the concentration of the analyte in the blank, the analytes are qualified as non-detects, "U".

The following analytes in the sample shown were qualified "U" for these reasons:

**A) Method/Instrument blank contamination:**

No problems found for this qualification

**B) Field or rinse blank contamination:**

No problems found for this qualification sample was the field blank.

**6. CALIBRATION:**

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

**A) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):**

For the PESTICIDE fraction, if %RSD exceeds 20% for all analytes except alpha-BHC and delta-BHC 25%, for the two surrogates and Toxaphene 30%, qualify all associated positive results "J" and non-detects are not qualified.

**B) The Percent Difference (%D) for each of the SCP and surrogate in the PEM used for CCV must be greater than or equal to -25% and less than or equal to 25.0%. The Percent Difference (%D) between the calibration Factor (CF) for each of the SCP and surrogate in the Calibration Verification Standard (CS3) and the mean calibration factor from the initial calibration must be greater than or equal to -20% and less than or equal to 20.0%. The Percent Difference not within limits, detected associated compounds are qualified "J" and non-detected associated compounds are qualified "UJ".**

The following analytes in the sample shown were qualified for %RSD and %D:

The following pesticide samples are associated with the percent resolution that did not meet the resolution criteria. Detected compounds are qualified JN. Non-detected compounds are qualified

R.

**4,4'-DDD** B7PT4, PBLKPE, PLCSPE

**Endosulfan I** B7PT4, PBLKPE, PLCSPE

The following pesticide samples are associated with RSD% exceeding criteria Detected compounds are qualified J. Non-detected compounds are not qualified.

**Methoxychlor** B7PT4, PBLKPE, PLCSPE

**Beta BHC** B7PT4, PBLKPE, PLCSPE

**7. COMPOUND IDENTIFICATION:**

The retention times of reported compounds must fall within the calculated retention time windows for the two chromatographic columns and a GC/MS confirmation is required if the concentration exceeds 10ng/ml in the final sample extract.

The following pesticide samples have percent differences between analyte results in the range of 26-50%. Detected compounds are qualified J.

**gamma-Chlordane** PLCSPE

**Dieldrin** PLCSPE

**Endrin** PLCSPE

**8. CONTRACT PROBLEMS NON-COMPLIANCE:** No problems.

**9. FIELD DOCUMENTATION:** No problems.

**10. OTHER PROBLEMS:**

None

11. This package contains re- extractions, re-analyses or dilution runs. Upon reviewing the QA results, the following Form 1(s) are identified NOT to be used.

None

SDG# B7Q32

#### 1. HOLDING TIME:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

No problems found for this qualification

#### 2. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

The following pesticide samples have surrogate percent recoveries outside the lower limit of the criteria window, but greater than 10%. Detected compounds are qualified J. Non-detected compounds are qualified UJ.

**Decachlorobiphenyl** B7Q32MS

4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Aldrin, Dieldrin, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin aldehyde, Endrin ketone, Heptachlor, Heptachlor epoxide, Methoxychlor, Toxaphene, alpha-BHC, alpha-Chlordane, beta-BHC, delta-BHC, gamma-BHC (Lindane), gamma-Chlordane

#### 3. MATRIX SPIKE/SPIKE DUPLICATE, MS/MSD:

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for additional qualification of data.

The following pesticide matrix/matrix spike duplicate samples have percent recoveries that are greater than or equal to the lower expanded criteria limit but less than the lower primary criteria limit. Detected compounds are qualified J. Non-detected compounds are qualified UJ.

**Aldrin** B7Q32MS, B7Q32MSD, B7Q32

**4,4'-DDT** B7Q32MS, B7Q32MSD, B7Q32

**Gamma-BHC (Lindane)** B7Q32MS, B7Q32MSD, B7Q32

**Dieldrin** B7Q32MS, B7Q32MSD, B7Q32

**Endrin** B7Q32MS, B7Q32MSD, B7Q32

**Heptachlor** B7Q32MS, B7Q32MSD, B7Q32

#### 4. LABORATORY CONTROL RECOVERY (LCS):

The LCS data is generated to determine the long-term precision and accuracy of the analytical method. The LCS may be used in conjunction with other QC criteria for additional qualification of data.

No problems found for this qualification

#### 5. BLANK CONTAMINATION:

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the concentration of the analyte in the blank, the analytes are qualified as non-detects, "U".

The following analytes in the sample shown were qualified "U" for these reasons:

##### A) Method/Instrument blank contamination:

No problems found for this qualification

##### B) Field or rinse blank contamination:

No problems found for this qualification

#### 6. CALIBRATION:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is

capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

**A) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):**

For the PESTICIDE fraction, if %RSD exceeds 20% for all analytes except alpha-BHC and delta-BHC 25%, for the two surrogates and Toxaphene 30%, qualify all associated positive results "J" and non-detects are not qualified.

**B) The Percent Difference (%D) for each of the SCP and surrogate in the PEM used for CCV must be greater than or equal to -25% and less than or equal to 25.0%. The Percent Difference (%D) between the calibration Factor (CF) for each of the SCP and surrogate in the Calibration Verification Standard (CS3) and the mean calibration factor from the initial calibration must be greater than or equal to -20% and less than or equal to 20.0%. The Percent Difference not within limits, detected associated compounds are qualified "J" and non-detected associated compounds are qualified "UJ".**

The following analytes in the sample shown were qualified for %RSD and %D:

The following pesticide samples are associated with the percent resolution that did not meet the resolution criteria. Detected compounds are qualified JN. Non-detected compounds are qualified R.

**4,4'-DDD** B7PT0, B7PT1, B7PW7, B7PW8, B7PX5, B7PX6, B7Q23, B7Q24, B7Q32, B7Q43, B7Q44, B7Q44DL, B7Q51, B7Q63, B7Q67, B7Q68, PBLKRL, PLCSRL, B7P23MS, B7P23MSD

**Endosulfan I** B7PT0, B7PT1, B7PW7, B7PW8, B7PX5, B7PX6, B7Q23, B7Q24, B7Q32, B7Q43, B7Q44, B7Q44DL, B7Q51, B7Q63, B7Q67, B7Q68, PBLKRL, PLCSRL, B7P23MS, B7P23MSD

The following pesticide samples are associated with RSD% exceeding criteria Detected compounds are qualified J. Non-detected compounds are not qualified.

**Methoxychlor** B7PT0, B7PT1, B7PW7, B7PW8, B7PX5, B7PX6, B7Q23, B7Q24, B7Q32, B7Q43, B7Q44, B7Q44DL, B7Q51, B7Q63, B7Q67, B7Q68, PBLKRL, PLCSRL, B7P23MS, B7P23MSD

**Beta BHC** B7PT0, B7PT1, B7PW7, B7PW8, B7PX5, B7PX6, B7Q23, B7Q24, B7Q32, B7Q43, B7Q44, B7Q44DL, B7Q51, B7Q63, B7Q67, B7Q68, PBLKRL, PLCSRL, B7P23MS, B7P23MSD

The following pesticide samples are associated with a CCV with % Difference exceeding criteria  
Detected compounds are qualified J. Non-detected compounds are qualified UJ.

**Decachlorobiphenyl** B7PT0, B7PQ32, B7PQ44, B7PQ44DL, B7PQ23MS, B7PQ23MSD

4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Aldrin, Dieldrin, Endosulfan I, Endosulfan II, Endosulfan sulfate,  
Endrin, Endrin aldehyde, Endrin ketone, Heptachlor, Heptachlor epoxide, Methoxychlor,  
Toxaphene, alpha-BHC, alpha-Chlordane, beta-BHC, delta-BHC, gamma-BHC (Lindane),  
gamma-Chlordane

## 7. COMPOUND IDENTIFICATION:

The retention times of reported compounds must fall within the calculated retention time windows  
for the two chromatographic columns and a GC/MS confirmation is required if the concentration  
exceeds 10ng/ml in the final sample extract.

The following pesticide samples have percent differences between analyte results in the range of  
26-50%. Detected compounds are qualified J.

**4,4'-DDT** B7Q32MS, B7Q32MSD

**gamma-Chlordane** B7Q68, PLCSRL

**Gamma-BHC (Lindane)** PLCSRL

**Endrin** B7Q32MS

**Endrin aldehyde** B7Q44, B7Q44DL

The following pesticide samples have percent differences between analyte results in the range of  
51-100%. Detected compounds are qualified NJ.

**Endosulfan II** B7Q44

**4,4'-DDT** B7Q44

**Endosulfan I B7Q44**

The following pesticide samples have percent differences between analyte results exceeding 50% and the results are below CRQL. Detected compounds are qualified U. Non-detected compounds are not qualified. Reported sample concentrations have been elevated to the CRQL.

**Endosulfan II B7Q44DL**

**4,4'-DDT B7Q44DL**

**Dieldrin B7Q44DL**

**4,4'-DDE B7Q68**

**Endosulfan I B7Q44DL**

The following pesticide samples have percent differences between analyte results exceeding 100%. Using professional judgment Detected compounds are qualified JN.

**gamma-Chlordane B7Q44DL**

The following pesticide samples have percent differences between analyte results exceeding 100%. Using professional judgment Detected compounds are qualified J.

**Heptachlor B7Q32MS, B7Q32MSD**

**Dieldrin B7Q32MS**

8. **CONTRACT PROBLEMS NON-COMPLIANCE:** No problems.
9. **FIELD DOCUMENTATION:** No problems.

**ATTACHMENT 1**  
**SOM01.2/Pesticide**  
**SOP NO. HW-36**

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**10. OTHER PROBLEMS:**

None

**11. This package contains re- extractions, re-analyses or dilution runs. Upon reviewing the QA results, the following Form 1(s) are identified NOT to be used.**

B7Q44DL

SDG# B7PS8

**1. HOLDING TIME:**

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

No problems found for this qualification

**2. SURROGATES**

All samples are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

No problems found for this qualification

**3. MATRIX SPIKE/SPIKE DUPLICATE, MS/MSD:**

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for additional qualification of data.

The following pesticide matrix/matrix spike duplicate samples have percent recoveries that are greater than or equal to the lower expanded criteria limit but less than the lower primary criteria limit. Detected compounds are qualified J. Non-detected compounds are qualified JJ.

**Aldrin** B7PZ6MS, B7PZ6MSD, B7PZ6

**Gamma-BHC (Lindane)** B7PZ6MS, B7PZ6MSD, B7PZ6

**Dieldrin** B7PZ6MS, B7PZ6MSD, B7PZ6

**Endrin** B7PZ6MS, B7PZ6MSD, B7PZ6

Heptachlor B7PZ6MS, B7PZ6MSD, B7PZ6

**4. LABORATORY CONTROL RECOVERY (LCS):**

The LCS data is generated to determine the long-term precision and accuracy of the analytical method. The LCS may be used in conjunction with other QC criteria for additional qualification of data.

No problems found for this qualification

**5. BLANK CONTAMINATION:**

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the concentration of the analyte in the blank, the analytes are qualified as non-detects, "U".

The following analytes in the sample shown were qualified "U" for these reasons:

**A) Method/Instrument blank contamination:**

No problems found for this qualification

**B) Field or rinse blank contamination:**

No problems found for this qualification

**6. CALIBRATION:**

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

**A) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):**

For the PESTICIDE fraction, if %RSD exceeds 20% for all analytes except alpha-BHC and delta-BHC 25%, for the two surrogates and Toxaphene 30%, qualify all associated positive results "J" and non-detects are not qualified.

**B) The Percent Difference (%D) for each of the SCP and surrogate in the PEM used for CCV**

must be greater than or equal to -25% and less than or equal to 25.0%. The Percent Difference (%D) between the calibration Factor (CF) for each of the SCP and surrogate in the Calibration Verification Standard (CS3) and the mean calibration factor from the initial calibration must be greater than or equal to -20% and less than or equal to 20.0%. The Percent Difference not within limits, detected associated compounds are qualified "J" and non-detected associated compounds are qualified "UJ".

The following analytes in the sample shown were qualified for %RSD and %D:

The following pesticide samples are associated with the percent resolution that did not meet the resolution criteria. Detected compounds are qualified JN. Non-detected compounds are qualified R.

**4,4'-DDD** B7PS8, B7PS9, B7PT5, B7PW0, B7PW3, B7PW4, B7PZ1, B7PZ2, B7PZ5, B7PZ6, B7PZ9, B7Q04, B7Q05, B7Q06, B7Q07, B7Q08, B7Q09, B7Q15, B7Q16, B7Q31, PBLKRJ, PLCSRJ, B7PZ6MS, B7PZ6MSD

**Endosulfan I** B7PS8, B7PS9, B7PT5, B7PW0, B7PW3, B7PW4, B7PZ1, B7PZ2, B7PZ5, B7PZ6, B7PZ9, B7Q04, B7Q05, B7Q06, B7Q07, B7Q08, B7Q09, B7Q15, B7Q16, B7Q31, PBLKRJ, PLCSRJ, B7PZ6MS, B7PZ6MSD

The following pesticide samples are associated with RSD% exceeding criteria Detected compounds are qualified J. Non-detected compounds are not qualified.

**Methoxychlor** B7PS8, B7PS9, B7PT5, B7PW0, B7PW3, B7PW4, B7PZ1, B7PZ2, B7PZ5, B7PZ6, B7PZ9, B7Q04, B7Q05, B7Q06, B7Q07, B7Q08, B7Q09, B7Q15, B7Q16, B7Q31, PBLKRJ, PLCSRJ, B7PZ6MS, B7PZ6MSD

**Beta BHC** B7PS8, B7PS9, B7PT5, B7PW0, B7PW3, B7PW4, B7PZ1, B7PZ2, B7PZ5, B7PZ6, B7PZ9, B7Q04, B7Q05, B7Q06, B7Q07, B7Q08, B7Q09, B7Q15, B7Q16, B7Q31, PBLKRJ, PLCSRJ, B7PZ6MS, B7PZ6MSD

## 7. COMPOUND IDENTIFICATION:

The retention times of reported compounds must fall within the calculated retention time windows for the two chromatographic columns and a GC/MS confirmation is required if the concentration exceeds 10ng/ml in the final sample extract.

The following pesticide samples have percent differences between analyte results in the range of 26-50%. Detected compounds are qualified J.

**Heptachlor epoxide** PLCSRJ

8. **CONTRACT PROBLEMS NON-COMPLIANCE:** No problems.

9. **FIELD DOCUMENTATION:** No problems.

10. **OTHER PROBLEMS:**

None

11. **This package contains re- extractions, re-analyses or dilution runs. Upon reviewing the QA results, the following Form 1(s) are identified NOT to be used.**

None

Functional Guidelines for Evaluating Organic Analysis

CASE No.: 40054  
LABORATORY: A4  
SAMPLER: CDM

SDG No.: B7PT4, B7Q32, B7PS8  
SITE: Raritan Bay Slag  
ANALYSIS: BNA & BNA-SIM

DATA ASSESSMENT

The current SOP HW-35/SVOA (Revision 1) August 2007, USEPA Region II Data Validation SOP for Statement of Work SOM01.2 for evaluating organic data have been applied.

Data has been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi- Automated Screening Results Report.

Tentatively Identified Compounds (TICS) for BNA organic fraction is not validated.

All data are valid and acceptable except those analytes rejected "R"(unusable). Due to the detection of QC problems, some analytes may have the "J" (estimated), "N" (presumptive evidence for the presence of the material), "U" (non-detect) or "JN" (presumptive evidence for the presence of the material at an estimated value) flag. All action is detailed on the attached sheets.

The "R" flag means that the associated value is unusable. In other words, significant data bias is evident and the reported analyte concentration is unreliable.

Reviewer's  
Signature: Dorina Christina Alliu

Date: July/14/2010

Peer Reviewer's  
Signature: \_\_\_\_\_

Date: \_\_\_\_ / \_\_\_\_ /2010

Verified By: \_\_\_\_\_

Date: \_\_\_\_ / \_\_\_\_ /2010

**SDG# B7PT4**

**1. HOLDING TIME:**

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

No problems found for this qualification as per NFG/CCS report

**2. SURROGATES**

All samples are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

**BNA:**

The following semi-volatile samples have deuterated monitoring compound recovery below the lower limit of the criteria window. Detected compounds are qualified J. Non-detected compounds are qualified UJ.

**Fluorene-d10 B7PT4**

4-Bromophenyl-phenylether, 4-Chlorophenyl-phenylether, Carbazole, Dibenzofuran, Fluorene

**Acenaphthylene-d8 B7PT4**

2-Chloronaphthalene, 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Naphthalene

**BNA-SIM:**

No problems found for this qualification as per NFG/CCS report

**3. MATRIX SPIKE/SPIKE DUPLICATE, MS/MSD:**

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for additional qualification of data.

Not applicable

**4. BLANK CONTAMINATION:**

Quality assurance (QA) blanks, i.e., method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. If the concentration of the analyte is less than 5 times the blank contaminant level (10 times for common contaminants), the analytes are qualified as non-detects, "U". The following analytes in the sample shown were qualified with "U" for these reasons:

**A)**

**Method blank contamination:**

No problems found for this qualification

**B)**

**Field or rinse blank contamination:**

No problems found for this qualification sample was the field blank.

**C)**

**Trip blank contamination for VOA aqueous samples:**

Not Applicable

**D)**

**Storage Blank associated with VOA samples only:**

Not Applicable

**E)**

**Tics "R" rejected:**

Tentatively Identified Compounds (TICS) for BNA organic fraction is not validated.

**5. MASS SPECTROMETER TUNING:**

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is (BFB) Bromofluorobenzene and for semi-volatiles Decafluorotriphenyl-phosphine (DFTPP).

If the mass calibration is in error, all associated data will be classified as unusable "R".

No problems found for this qualification as per NFG/CCS report

**6. CALIBRATION:**

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

**A) Response Factor GC/MS:**

The response factor measures the instrument's response to specific chemical compounds. The response factor for the Target Compound List (TCL) must be 0.05 in both initial and continuing calibrations. A value < 0.05 indicates a serious detection and quantitation problem (poor sensitivity). Analytes detected in the sample will be qualified as estimated, "J". All non-detects for that compound will be rejected "R".

**BNA:**

No problems found for this qualification as per NFG/CCS report

**BNA-SIM:**

The following semi-volatile samples are associated with an initial/ continuing/ closing calibration with relative response factors (RRFs) outside criteria. Detected compounds are qualified J. Non-detected compounds are qualified "R"

**Pentachlorophenol B7PT4, SBLK2X**

**B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):**

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific

compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance. Percent RSD must be < 30% and %D must be < 25%. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and non-detects are flagged "UJ". If %RSD and %D grossly exceed QC criteria, non-detects data may be qualified "R".

The following analytes in the sample shown were qualified for %RSD and %D:

**BNA:**

The following semi-volatile samples are associated with an initial calibration percent relative standard deviation (%RSD) outside criteria. Detected compounds are qualified J. Non-detected compounds are not qualified.

**Benzo (b) fluoranthene** B7PT4, SBLK2W

**Benzo (k) fluoranthene** B7PT4, SBLK2W

**2,3,4,6-Tetrachlorophenol** B7PT4, SBLK2W

**Pentachlorophenol** B7PT4, SBLK2W

The following semi-volatile samples are associated with incorrect initial calibration sequence. Detected compounds are qualified J. Non-detected compounds are qualified UJ.

**Pentachlorophenol** B7PT4, SBLK2W

**BNA-SIM:**

The following semi-volatile samples are associated with an initial calibration percent relative standard deviation (%RSD) outside criteria. Detected compounds are qualified J. Non-detected compounds are not qualified.

**Dibenzo (a,h) anthracene** B7PT4, SBLK2X

Pentachlorophenol B7PT4, SBLK2X

**8. INTERNAL STANDARDS PERFORMANCE GC/MS:**

Internal standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must not vary by more than a factor of 2 (-50% to +100%) from the associated continuing calibration standard. The retention time of the internal standard must not vary more than 30 seconds from the associated continuing calibration standard. If the area count is outside the (-50% to +100%) range of the associated standard, all of the positive results for compounds quantitated using that IS are qualified as estimated, "J", and all non-detects as "UJ", or "R" if there is a severe loss of sensitivity.

If an internal standard retention time varies by more than 30 seconds, the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction.

No problems found for this qualification as per NFG/CCS report

**9. COMPOUND IDENTIFICATION:**

**A) Semi-Volatile Fractions:**

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within 0.06 RRT units of the standard compound and have an ion spectra which has a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications.

No problems found for this qualification as per NFG/CCS report

**10. CONTRACT PROBLEMS NON-COMPLIANCE:**

None

**11. FIELD DOCUMENTATION:**

No problems

ATTACHMENT 1  
SOM01.2/Semivolatiles  
SOP NO. HW-35/SVOA, Rev.1

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12. OTHER PROBLEMS:

None

13. This package contains re-extractions, re-analyses or dilutions. Upon reviewing the QA results, the following Form 1(s) are identified NOT to be used.

None

SDG# B7Q32

1. HOLDING TIME:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

No problems found for this qualification as per NFG/CCS report

2. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

**BNA:**

The following semi-volatile samples have deuterated monitoring compound recovery above the upper limit of the criteria window. Detected compounds are qualified J. Non-detected compounds are not qualified.

**Pyrene-d10 B7PT1**

Benzo(a)anthracene, Chrysene, Fluoranthene, Pyrene

The following semi-volatile samples have deuterated monitoring compound recovery below the lower limit of the criteria window. Detected compounds are qualified J. Non-detected compounds are qualified JJ.

**Benzo (a) pyrene-d12 B7Q63**

Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene,  
Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene

**BNA-SIM:**

No problems found for this qualification as per NFG/CCS report

**3. MATRIX SPIKE/SPIKE DUPLICATE, MS/MSD:**

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for additional qualification of data.

Not applicable

**4. BLANK CONTAMINATION:**

Quality assurance (QA) blanks, i.e., method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. If the concentration of the analyte is less than 5 times the blank contaminant level (10 times for common contaminants), the analytes are qualified as non-detects, "U". The following analytes in the sample shown were qualified with "U" for these reasons:

**A)**

**Method blank contamination:**

No problems found for this qualification

**B) Field or rinse blank contamination:**

**BNA:**

The following semi-volatile samples have analyte concentrations reported less than the CRQL. The associated rinse blank concentration is less than the concentration criteria. Detected compounds are qualified U. Non-detected compounds are not qualified. Reported sample concentrations have been elevated to the CRQL.

**Bis(2-ethylhexyl) phthalate** B7PW8, B7Q44, B7Q68

**BNA-SIM:**

The following semi-volatile samples have analyte concentrations reported less than the CRQL. The associated rinse blank concentration is less than the concentration criteria. Detected compounds are qualified U. Non-detected compounds are not qualified. Reported sample concentrations have been elevated to the CRQL.

**Benzo(a)pyrene** B7PT0, B7PW7, B7PW8, B7Q23DL, B7Q44DL, B7Q63DL, B7Q68DL

**Indenzo (1,2,3 cd)pyrene** B7Q24, B7Q43, B7Q51

**Dibenzo(ah)anthracene** B7PT0, B7PW7, B7PW8, B7PX5, B7PX6, B7Q24, B7Q32DL, B7Q43, B7Q44DL, B7Q51, B7Q63DL, B7Q68DL

**Benzo (ghi)perylene** B7PX5, B7PX6, B7Q24, B7Q32DL, B7Q43, B7Q44DL, B7Q51, B7Q63DL.

**C) Trip blank contamination for VOA aqueous samples:**

Not Applicable

**D) Storage Blank associated with VOA samples only:**

Not Applicable

**E) Tics "R" rejected:**

Tentatively Identified Compounds (TICS) for BNA organic fraction is not validated.

**5. MASS SPECTROMETER TUNING:**

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is (BFB) Bromofluorobenzene and for semi-volatiles Decafluorotriphenyl-phosphine (DFTPP).

If the mass calibration is in error, all associated data will be classified as unusable "R".

No problems found for this qualification as per NFG/CCS report

**6. CALIBRATION:**

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

**A) Response Factor GC/MS:**

The response factor measures the instrument's response to specific chemical compounds. The response factor for the Target Compound List (TCL) must be 0.05 in both initial and continuing calibrations. A value < 0.05 indicates a serious detection and quantitation problem (poor sensitivity). Analytes detected in the sample will be qualified as estimated, "J". All non-detects for that compound will be rejected "R".

**BNA:**

No problems found for this qualification as per NFG/CCS report

**BNA-SIM:**

The following semi-volatile samples are associated with an initial/ continuing/ closing calibration with relative response factors (RRFs) outside criteria. Detected compounds are qualified J. Non-detected compounds are qualified "R"

**Pentachlorophenol** B7PT0, B7PT1, B7PW7, B7PW8, B7PX5, B7PX6, B7Q23, B7Q23DL, B7Q24, B7Q32, B7Q32DL, B7Q43, B7Q44, B7Q44DL, B7Q51, B7Q63, B7Q63DL, B7Q67, B7Q68, B7Q68DL, SBLK1U

**B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):**

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance. Percent RSD must be < 30% and %D must be < 25%. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and non-detects are flagged "UJ". If %RSD and %D grossly exceed QC criteria, non-detects data may be qualified "R".

The following analytes in the sample shown were qualified for %RSD and %D:

**BNA:**

The following semi-volatile samples are associated with an initial calibration percent relative standard deviation (%RSD) outside criteria. Detected compounds are qualified J. Non-detected compounds are not qualified.

**Benzo (b) fluoranthene** B7PT0, B7PT1, B7PW7, B7PW8, B7PX5, B7PX6, B7Q23, B7Q24, B7Q32, B7Q43, B7Q44, B7Q51, B7Q63, B7Q67, B7Q68, SBLK1T

**Benzo (k) fluoranthene** B7PT0, B7PT1, B7PW7, B7PW8, B7PX5, B7PX6, B7Q23, B7Q24, B7Q32, B7Q43, B7Q44, B7Q51, B7Q63, B7Q67, B7Q68, SBLK1T

**2,3,4,6-Tetrachlorophenol** B7PT0, B7PT1, B7PW7, B7PW8, B7PX5, B7PX6, B7Q23, B7Q24, B7Q32, B7Q43, B7Q44, B7Q51, B7Q63, B7Q67, B7Q68, SBLK1T

**Pentachlorophenol** B7PT0, B7PT1, B7PW7, B7PW8, B7PX5, B7PX6, B7Q23, B7Q24, B7Q32, B7Q43, B7Q44, B7Q51, B7Q63, B7Q67, B7Q68, SBLK1T

**BNA-SIM:**

The following semi-volatile samples are associated with an initial calibration percent relative standard deviation (%RSD) outside criteria. Detected compounds are qualified J. Non-detected compounds are not qualified.

**Dibenzo (a,h) anthracene** B7PT0, B7PT1, B7PW7, B7PW8, B7PX5, B7PX6, B7Q23, B7Q23DL, B7Q24, B7Q32, B7Q32DL, B7Q43, B7Q44, B7Q44DL, B7Q51, B7Q63, B7Q63DL, B7Q67, B7Q68, B7Q68DL, SBLK1U

**Pentachlorophenol** B7PT0, B7PT1, B7PW7, B7PW8, B7PX5, B7PX6, B7Q23, B7Q23DL, B7Q24, B7Q32, B7Q32DL, B7Q43, B7Q44, B7Q44DL, B7Q51, B7Q63, B7Q63DL, B7Q67, B7Q68, B7Q68DL, SBLK1U

The following semi-volatile samples are associated with incorrect initial calibration sequence. Detected compounds are qualified J. Non-detected compounds are qualified UJ. Use professional judgment to qualify the data.

**Indeno (1,2,3-cd) pyrene** B7PT0, B7PT1, B7PW7, B7PW8, B7PX5, B7PX6, B7Q24, B7Q32DL, B7Q44DL, B7Q63DL, B7Q67, B7Q68DL

**Pentachlorophenol** B7PT0, B7PT1, B7PW7, B7PW8, B7PX5, B7PX6, B7Q23, B7Q23DL, B7Q24, B7Q32DL, B7Q44DL, B7Q63DL, B7Q67, B7Q68DL

**8. INTERNAL STANDARDS PERFORMANCE GC/MS:**

Internal standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must not vary by more than a factor of 2 (-50% to +100%) from the associated continuing calibration standard. The retention time of the internal standard must not vary more than 30 seconds from the associated continuing calibration standard. If the area count is outside the (-50% to +100%) range of the associated standard, all of the positive results for compounds quantitated using that IS are qualified as estimated, "J", and all non-detects as "UJ", or "R" if there is a severe loss of sensitivity.

If an internal standard retention time varies by more than 30 seconds, the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction.

No problems found for this qualification as per NFG/CCS report

**9. COMPOUND IDENTIFICATION:**

**A) Semi-Volatile Fractions:**

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within 0.06 RRT units of the standard compound and have an ion spectra which has a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications.

No problems found for this qualification as per NFG/CCS report

**10. CONTRACT PROBLEMS NON-COMPLIANCE:**

None

11. **FIELD DOCUMENTATION:**

No problems

12. **OTHER PROBLEMS:**

**BNA:**

None

**BNA-SIM:**

Several compounds have been reported from the initial analysis and qualified J as the reported value was over the calibration range. The DL run had U qualifier which was not transfer to the original run.

**Sample #** B7Q23

13. **This package contains re-extractions, re-analyses or dilutions. Upon reviewing the QA results, the following Form 1(s) are identified NOT to be used.**

**BNA:**

None

**BNA-SIM:**

B7Q23DL, B7Q32DL, B7Q44DL, B7Q63DL, B7Q68DL

SDG# B7PS8

1. HOLDING TIME:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

No problems found for this qualification as per NFG/CCS report

2. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

**BNA:**

The following semi-volatile samples have deuterated monitoring compound recovery above the upper limit of the criteria window. Detected compounds are qualified J. Non-detected compounds are not qualified.

**Pyrene-d10** B7PS9, B7Q04, B7Q05

Benzo(a)anthracene, Chrysene, Fluoranthene, Pyrene

**4-Methylphenol-d8** B7Q05

2,4-Dimethylphenol, 2-Methylphenol, 4-Methylphenol

**2-Nitrophenol-d4** B7Q05

2-Nitrophenol, Isophorone

**Bis (2-Chloroethyl) ether-d8** B7PS9, B7Q05  
2,2'-Oxybis(1-Chloropropane), Bis(2-Chloroethoxy)methane, Bis(2-Chloroethyl)ether

**BNA-SIM:**

No problems found for this qualification as per NFG/CCS report

**3. MATRIX SPIKE/SPIKE DUPLICATE, MS/MSD:**

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for additional qualification of data.

Not applicable

**4. BLANK CONTAMINATION:**

Quality assurance (QA) blanks, i.e., method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. If the concentration of the analyte is less than 5 times the blank contaminant level (10 times for common contaminants), the analytes are qualified as non-detects, "U". The following analytes in the sample shown were qualified with "U" for these reasons:

**A)**

**Method blank contamination:**

No problems found for this qualification

**B)**

**Field or rinse blank contamination:**

**BNA:**

The following semi-volatile samples have analyte concentrations reported less than the CRQL. The associated rinse blank concentration is less than the concentration criteria. Detected compounds are qualified U. Non-detected compounds are not qualified. Reported sample concentrations have been elevated to the CRQL.

**Bis(2-ethylhexyl) phthalate** B7PS9, B7PW0, B7PW4, B7PZ1, B7PZ2, B7Q06, B7Q07

**BNA-SIM:**

The following semi-volatile samples have analyte concentrations reported less than the CRQL. The associated rinse blank concentration is less than the concentration criteria. Detected compounds are qualified U. Non-detected compounds are not qualified. Reported sample concentrations have been elevated to the CRQL.

**Benzo(a)pyrene** B7PS9DL, B7PT5, B7PZ1, B7PZ5DL, B7PZ6, B7PZ9, B7Q04, B7Q05, B7Q31DL

**Indenzo (1,2,3 cd)pyrene** B7PT5, B7PW3, B7PZ1, B7PZ2, B7PZ6, B7Q09, B7Q15DL, B7Q31DL

**Dibenzo(ah)anthracene** B7PS9DL, B7PT5, B7PW0, B7PW3, B7PZ1, B7PZ2, B7PZ6, B7PZ9, B7Q04, B7Q05, B7Q06DL, B7Q07DL, B7Q08, B7Q09, B7Q16, B7Q31DL

**Benzo (ghi)perylene** B7PS9DL, B7PT5, B7PW3, B7PZ1, B7PZ2, B7PZ6, B7PZ9, B7Q04, B7Q05, B7Q06DL, B7Q09, B7Q31DL

**C) Trip blank contamination for VOA aqueous samples:**

Not Applicable

**D) Storage Blank associated with VOA samples only:**

Not Applicable

**E) Tics "R" rejected:**

Tentatively Identified Compounds (TICS) for BNA organic fraction is not validated.

**5. MASS SPECTROMETER TUNING:**

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is (BFB) Bromofluorobenzene and for semi-volatiles Decafluorotriphenyl-phosphine (DFTPP).

If the mass calibration is in error, all associated data will be classified as unusable "R".

No problems found for this qualification as per NFG/CCS report

**6. CALIBRATION:**

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

**A) Response Factor GC/MS:**

The response factor measures the instrument's response to specific chemical compounds. The response factor for the Target Compound List (TCL) must be 0.05 in both initial and continuing calibrations. A value < 0.05 indicates a serious detection and quantitation problem (poor sensitivity). Analytes detected in the sample will be qualified as estimated, "J". All non-detects for that compound will be rejected "R".

**BNA:**

No problems found for this qualification as per NFG/CCS report

**BNA-SIM:**

The following semi-volatile samples are associated with an initial/ continuing/ closing calibration with relative response factors (RRFs) outside criteria. Detected compounds are qualified J. Non-detected compounds are qualified "R"

**Pentachlorophenol** B7PS8, B7PS9, B7PS9DL, B7PT5, B7PW0, B7PW3, B7PW4, B7PZ1, B7PZ2, B7PZ5, B7PZ5DL, B7PZ6, B7PZ9, B7Q04, B7Q05, B7Q06, B7Q06DL, B7Q07, B7Q07DL, B7Q08, B7Q09, B7Q15, B7Q15DL, B7Q16, B7Q31, B7Q31DL, SBLK1S

**B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):**

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance. Percent RSD must be < 30% and %D must be < 25%. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and non-detects are flagged "UJ". If %RSD and %D grossly exceed QC criteria, non-detects data may be qualified "R".

The following analytes in the sample shown were qualified for %RSD and %D:

**BNA:**

The following semi-volatile samples are associated with an initial calibration percent relative standard deviation (%RSD) outside criteria. Detected compounds are qualified J. Non-detected compounds are not qualified.

**Benzo (b) fluoranthene** B7PS8, B7PS9, B7PT5, B7PW0, B7PW3, B7PW4, B7PZ1, B7PZ2, B7PZ5, B7PZ6, B7PZ9, B7Q04, B7Q05, B7Q06, B7Q07, B7Q08, B7Q09, B7Q15, B7Q16, B7Q31, SBLK1R

**Benzo (k) fluoranthene** B7PS8, B7PS9, B7PT5, B7PW0, B7PW3, B7PW4, B7PZ1, B7PZ2, B7PZ5, B7PZ6, B7PZ9, B7Q04, B7Q05, B7Q06, B7Q07, B7Q08, B7Q09, B7Q15, B7Q16, B7Q31, SBLK1R

**2,3,4,6-Tetrachlorophenol** B7PS8, B7PS9, B7PT5, B7PW0, B7PW3, B7PW4, B7PZ1, B7PZ2, B7PZ5, B7PZ6, B7PZ9, B7Q04, B7Q05, B7Q06, B7Q07, B7Q08, B7Q09, B7Q15, B7Q16, B7Q31, SBLK1R

**Pentachlorophenol** B7PS8, B7PS9, B7PT5, B7PW0, B7PW3, B7PW4, B7PZ1, B7PZ2, B7PZ5, B7PZ6, B7PZ9, B7Q04, B7Q05, B7Q06, B7Q07, B7Q08, B7Q09, B7Q15, B7Q16, B7Q31, SBLK1R

The following semi-volatile samples are associated with incorrect initial calibration sequence. Detected compounds are qualified J. Non-detected compounds are qualified UJ.

**Pentachlorophenol** B7PS9, B7PT5, B7PW4, B7PZ1, B7PZ2, B7PZ6, B7PZ9, B7Q04, B7Q05, B7Q06, B7Q08, B7Q09, B7Q16, B7Q31

**BNA-SIM:**

The following semi-volatile samples are associated with an initial calibration percent relative standard deviation (%RSD) outside criteria. Detected compounds are qualified J. Non-detected compounds are not qualified.

**Dibenzo (a,h) anthracene** B7PS8, B7PS9, B7PS9DL, B7PT5, B7PW0, B7PW3, B7PW4, B7PZ1, B7PZ2, B7PZ5, B7PZ5DL, B7PZ6, B7PZ9, B7Q04, B7Q05, B7Q06, B7Q06DL, B7Q07, B7Q07DL, B7Q08, B7Q09, B7Q15, B7Q15DL, B7Q16, B7Q31, B7Q31DL, SBLK1S

**Pentachlorophenol** B7PS8, B7PS9, B7PS9DL, B7PT5, B7PW0, B7PW3, B7PW4, B7PZ1, B7PZ2, B7PZ5, B7PZ5DL, B7PZ6, B7PZ9, B7Q04, B7Q05, B7Q06, B7Q06DL, B7Q07, B7Q07DL, B7Q08, B7Q09, B7Q15, B7Q15DL, B7Q16, B7Q31, B7Q31DL, SBLK1S

#### 8. INTERNAL STANDARDS PERFORMANCE GC/MS:

Internal standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must not vary by more than a factor of 2 (-50% to +100%) from the associated continuing calibration standard. The retention time of the internal standard must not vary more than 30 seconds from the associated continuing calibration standard. If the area count is outside the (-50% to +100%) range of the associated standard, all of the positive results for compounds quantitated using that IS are qualified as estimated, "J", and all non-detects as "UJ", or "R" if there is a severe loss of sensitivity.

If an internal standard retention time varies by more than 30 seconds, the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction.

No problems found for this qualification as per NFG/CCS report

#### 9. COMPOUND IDENTIFICATION:

##### A) Semi-Volatile Fractions:

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within 0.06 RRT units of the standard compound and have an ion spectra which has a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications.

No problems found for this qualification as per NFG/CCS report

10. **CONTRACT PROBLEMS NON-COMPLIANCE:**

None

11. **FIELD DOCUMENTATION:**

No problems

12. **OTHER PROBLEMS:**

**BNA:**

None

**BNA-SIM:**

Several compounds have been reported from the initial analysis and qualified J as the reported value was over the calibration range. The DL run had U qualifier which was not transfer to the original run.

**Sample #** B7PS9, B7PZ5, B7Q15

13. **This package contains re-extractions, re-analyses or dilutions. Upon reviewing the QA results, the following Form 1(s) are identified NOT to be used.**

**BNA:**

None

**BNA-SIM:**

B7PS9DL, B7PZ5DL, B7Q06DL, B7Q07DL, B7Q15DL, B7Q31DL.

**ATTACHMENT 1**

**SOM01.2/Low/Med**

**SOP NO. HW-33/VOA, Rev.1**

**Page 1 of 15**

**Functional Guidelines for Evaluating Organic Analysis**

**CASE No.: 40054  
LABORATORY: A4  
SAMPLER: CDM**

**SDG No.: B7PT4, B7Q32, B7PS8  
SITE: Raritan Bay Slag  
ANALYSIS: VOA**

**DATA ASSESSMENT**

The current SOP HW-33/VOA (Revision 1) August 2007, USEPA Region II Data Validation SOP for Statement of Work SOM01.2 for evaluating organic data has been applied.

Data has been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi- Automated Screening Results Report.

Tentatively Identified Compounds (TICS) for VOA organic fraction is not validated.

All data are valid and acceptable except those analytes rejected "R"(unusable). Due to the detection of QC problems, some analytes may have the "J" (estimated), "N"(presumptive evidence for the presence of the material), "U" (non-detect) or "JN" (presumptive evidence for the presence of the material at an estimated value) flag. All action is detailed on the attached sheets.

The "R" flag means that the associated value is unusable. In other words, significant data bias is evident and the reported analyte concentration is unreliable.

**Reviewer's  
Signature:** Dorina Christina Alliu

**Date:** July/13/2010

**Peer Reviewer's  
Signature:** \_\_\_\_\_

**Date:** \_\_\_\_/\_\_\_\_/2010

**Verified By:** \_\_\_\_\_

**Date:** \_\_\_\_/\_\_\_\_/2010

SDG# B7PT4

**1. HOLDING TIME:**

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

No problems found for this qualification as per NFG/CCS report

**2. DMC's**

All samples are spiked with surrogate compounds (DMC's) prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

The following volatile samples have one or more DMC/SMC recovery values is less than the primary lower limit but greater than or equal to the expanded lower limit of the criteria window. Detected compounds are qualified J. Non-detected compounds are qualified UJ.

**1,2-Dichloroethane-d4 B7PT4**

1,1,1-Trichloroethane, 1,1,2-Trichloro-1,2,2-trifluoroethane, 1,2-Dibromoethane, 1,2-Dichloroethane, Carbon tetrachloride, Methyl acetate, Methyl tert-butyl ether, Methylene chloride, Trichlorofluoromethane

**1,1,2,2-Tetrachloroethane-d2 B7PT4**

1,1,2,2-Tetrachloroethane, 1,2-Dibromo-3-chloropropane

**3. MATRIX SPIKE/SPIKE DUPLICATE, MS/MSD:**

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for additional qualification of data.

No problems found for this qualification as per NFG/CCS report

**4. BLANK CONTAMINATION:**

Quality assurance (QA) blanks, i.e., method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. If the concentration of the analyte is less than 1 times the blank contaminant level (2 times for common contaminants), the analytes are qualified as non-detects, "U".

The following analytes in the sample shown were qualified with "U" for these reasons:

**A) Method blank contamination:**

No problems found for this qualification

**B) Field or rinse blank contamination:**

No problems found for this qualification sample was the field blank.

**C) Trip blank contamination for VOA aqueous samples:**

Not Applicable

**D) Storage Blank associated with VOA samples only:**

No problems found for this qualification

**E) Tics "R" rejected:**

Tentatively Identified Compounds (TICS) for VOA organic fraction is not validated.

**5. MASS SPECTROMETER TUNING:**

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is (BFB) Bromofluorobenzene.

If the mass calibration is in error, all associated data will be classified as unusable "R".

No problems found for this qualification as per NFG/CCS report

**6. CALIBRATION:**

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

**A) Response Factor GC/MS:**

The response factor measures the instrument's response to specific chemical compounds. The response factor for the Target Compound List (TCL) must be  $\geq 0.05$ , and  $\geq 0.01$  for the twenty -two analytes with poor response in both the initial and continuing calibrations. A value  $< 0.05$ , or  $< 0.01$  for the poor performers indicates a serious detection and quantitation problem (poor sensitivity). Analytes detected in the sample will be qualified as estimated, "J". All non-detects for that compound will be rejected "R".

No problems found for this qualification as per NFG/CCS report

**B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):**

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance. Percent RSD must be  $< 20\%$ ,  $< 40\%$  for the poor performers, and  $< 50\%$  for 1,4-Dioxane. %D must be  $< 25\%$ ,  $< 40\%$  for the poor performers, and  $< 50\%$  for 1,4-Dioxane. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and non-detects are flagged "UJ". If %RSD and %D grossly exceed QC criteria ( $> 90\%$ ), non-detects data may be qualified "R".

The following analytes in the sample shown were qualified for %RSD and %D:

No problems found for this qualification as per NFG/CCS report

**8. INTERNAL STANDARDS PERFORMANCE GC/MS:**

Internal standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must not vary by more than a factor of 2 ( $-50\%$  to  $+200\%$ ) from the associated continuing calibration standard. The retention time of the internal standard must not vary more than 30 seconds from the associated continuing calibration standard. If the area count is outside the ( $-50\%$  to  $+200\%$ ) range of the associated standard, all of the positive results for compounds quantitated using that IS are qualified as estimated, "J", and all non-detects as "UJ", or "R" if there is a severe loss of sensitivity.

If an internal standard retention time varies by more than 30 seconds, the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction.

No problems found for this qualification as per NFG/CCS report

**9. COMPOUND IDENTIFICATION:**

**A) Volatile Fraction:**

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within 0.06 RRT units of the standard compound and have ion spectra which has a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications.

No problems found for this qualification.

**10. CONTRACT PROBLEMS NON-COMPLIANCE:**

None

**11. FIELD DOCUMENTATION:**

No problems found for this qualification.

**12. OTHER PROBLEMS:**

None

**13. This package contains reextractions, reanalyses or dilutions. Upon reviewing the QA results, the following Form 1(s) are identified NOT to be used.**

None

SDG# B7Q32

1. **HOLDING TIME:**

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

No problems found for this qualification as per NFG/CCS report

2. **DMC's**

All samples are spiked with surrogate compounds (DMC's) prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

The following volatile samples have one or more DMC/SMC recovery values is less than the primary lower limit but greater than or equal to the expanded lower limit of the criteria window. Detected compounds are qualified J. Non-detected compounds are qualified UJ.

**1,2-Dichloroethane-d4** B7Q23

1,1,1-Trichloroethane, 1,1,2-Trichloro-1,2,2-trifluoroethane, 1,2-Dibromoethane, 1,2-Dichloroethane, Carbon tetrachloride, Methyl acetate, Methyl tert-butyl ether, Methylene chloride, Trichlorofluoromethane

**1,4-Dioxane-d8** B7PX5

1,4-Dioxane

**Vinyl chloride-d3** B7Q23, B7Q24

Vinyl chloride

**trans-1,3-Dichloropropene-d4** B7PT1, B7PW8, B7Q23, B7Q24, B7Q32MS, B7Q68

1,1,2-Trichloroethane, cis-1,3-Dichloropropene, trans-1,3-Dichloropropene

3. **MATRIX SPIKE/SPIKE DUPLICATE, MS/MSD:**

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for additional qualification of data.

No problems found for this qualification as per NFG/CCS report

**4. BLANK CONTAMINATION:**

Quality assurance (QA) blanks, i.e., method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. If the concentration of the analyte is less than 1 times the blank contaminant level (2 times for common contaminants), the analytes are qualified as non-detects, "U".

The following analytes in the sample shown were qualified with "U" for these reasons:

**C) Method blank contamination:**

No problems found for this qualification

**D) Field or rinse blank contamination:**

The following volatile samples have common contaminant analyte concentrations reported less than 2x the CRQL. The associated rinse blank common contaminant concentration is less than 2x the concentration criteria. Detected compounds are qualified U. Non-detected compounds are not qualified. Reported sample concentrations have been elevated to the CRQL.

**Methylene Chloride** B7Q63, B7Q67

**C) Trip blank contamination for VOA aqueous samples:**

Not Applicable

**D) Storage Blank associated with VOA samples only:**

No problems found for this qualification

**E) Tics "R" rejected:**

Tentatively Identified Compounds (TICS) for VOA organic fraction is not validated.

## 5. MASS SPECTROMETER TUNING:

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is (BFB) Bromofluorobenzene.

If the mass calibration is in error, all associated data will be classified as unusable "R".

No problems found for this qualification as per NFG/CCS report

## 6. CALIBRATION:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

### A) Response Factor GC/MS:

The response factor measures the instrument's response to specific chemical compounds. The response factor for the Target Compound List (TCL) must be  $\geq 0.05$ , and  $\geq 0.01$  for the twenty-two analytes with poor response in both the initial and continuing calibrations. A value  $< 0.05$ , or  $< 0.01$  for the poor performers indicates a serious detection and quantitation problem (poor sensitivity). Analytes detected in the sample will be qualified as estimated, "J". All non-detects for that compound will be rejected "R".

No problems found for this qualification as per NFG/CCS report

### B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance. Percent RSD must be  $< 20\%$ ,  $< 40\%$  for the poor performers, and  $< 50\%$  for 1,4-Dioxane. %D must be  $< 25\%$ ,  $< 40\%$  for the poor performers, and  $< 50\%$  for 1,4-Dioxane. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and non-detects are flagged "UJ". If %RSD and %D grossly exceed QC criteria ( $> 90\%$ ), non-detects data may be qualified "R".

The following analytes in the sample shown were qualified for %RSD and %D:

The following volatile samples are associated with an initial calibration percent relative standard deviation (%RSD) outside criteria. Detected compounds are qualified J. Non-detected compounds are not qualified.

**Bromomethane VBLK6H, VHBLK0C**

The following volatile samples are associated with an opening or closing CCV percent difference (%D) outside criteria. Detected compounds are qualified J. Non-detected compounds are qualified UJ.

**1,2,4-Trichlorobenzene** B7PT0, B7Q32, B7Q43, B7Q44, B7Q51, B7Q63, B7Q67, B7Q68, VBLK66

**8. INTERNAL STANDARDS PERFORMANCE GC/MS:**

Internal standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must not vary by more than a factor of 2 (-50% to +200%) from the associated continuing calibration standard. The retention time of the internal standard must not vary more than 30 seconds from the associated continuing calibration standard. If the area count is outside the (-50% to +200%) range of the associated standard, all of the positive results for compounds quantitated using that IS are qualified as estimated, "J", and all non-detects as "UJ", or "R" if there is a severe loss of sensitivity.

If an internal standard retention time varies by more than 30 seconds, the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction.

No problems found for this qualification as per NFG/CCS report

**9. COMPOUND IDENTIFICATION:**

**A) Volatile Fraction:**

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within 0.06 RRT units of the standard compound and have ion spectra which has a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications.

No problems found for this qualification.

**10. CONTRACT PROBLEMS NON-COMPLIANCE:**

None

**11. FIELD DOCUMENTATION:**

No problems found for this qualification.

**12. OTHER PROBLEMS:**

**ATTACHMENT 1**

**SOM01.2/Low/Med**

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None

- 13. This package contains reextractions, reanalyses or dilutions. Upon reviewing the QA results, the following Form 1(s) are identified NOT to be used.**

None

SDG# B7PS8

1. HOLDING TIME:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

No problems found for this qualification as per NFG/CCS report

2. DMC's

All samples are spiked with surrogate compounds (DMC's) prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

The following volatile samples have DMC/SMC recoveries above the upper limit of the criteria window. Detected compounds are qualified J. Non-detected compounds are not qualified.

**2-Butanone-d5** B7Q07

2-Butanone, Acetone

**2-Hexanone-d5** B7Q07

2-Hexanone, 4-Methyl-2-pentanone

The following volatile samples have one or more DMC/SMC recovery values is less than the primary lower limit but greater than or equal to the expanded lower limit of the criteria window. Detected compounds are qualified J. Non-detected compounds are qualified JJ.

**1,2-Dichloroethane-d4** B7Q08

1,1,1-Trichloroethane, 1,1,2-Trichloro-1,2,2-trifluoroethane, 1,2-Dibromoethane, 1,2-Dichloroethane, Carbon tetrachloride, Methyl acetate, Methyl tert-butyl ether, Methylene chloride, Trichlorofluoromethane

**Vinyl chloride-d3** B7PW0, B7Q15, B7Q31

Vinyl chloride

**trans-1,3-Dichloropropene-d4** B7PW0, B7Q08, B7Q09, B7Q15

1,1,2-Trichloroethane, cis-1,3-Dichloropropene, trans-1,3-Dichloropropene

**3. MATRIX SPIKE/SPIKE DUPLICATE, MS/MSD:**

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for additional qualification of data.

No problems found for this qualification as per NFG/CCS report

**4. BLANK CONTAMINATION:**

Quality assurance (QA) blanks, i.e., method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. If the concentration of the analyte is less than 1 times the blank contaminant level (2 times for common contaminants), the analytes are qualified as non-detects, "U".

The following analytes in the sample shown were qualified with "U" for these reasons:

**E) Method blank contamination:**

No problems found for this qualification

**F) Field or rinse blank contamination:**

The following volatile samples have common contaminant analyte concentrations reported less than 2x the CRQL. The associated rinse blank common contaminant concentration is less than 2x the concentration criteria. Detected compounds are qualified U. Non-detected compounds are not qualified. Reported sample concentrations have been elevated to the CRQL.

**Methylene Chloride** B7PS8

**C) Trip blank contamination for VOA aqueous samples:**

Not Applicable

**D) Storage Blank associated with VOA samples only:**

No problems found for this qualification

**E) Tics "R" rejected:**

Tentatively Identified Compounds (TICS) for VOA organic fraction is not validated.

**5. MASS SPECTROMETER TUNING:**

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is (BFB) Bromofluorobenzene.

If the mass calibration is in error, all associated data will be classified as unusable "R".

No problems found for this qualification as per NFG/CCS report

**6. CALIBRATION:**

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

**A) Response Factor GC/MS:**

The response factor measures the instrument's response to specific chemical compounds. The response factor for the Target Compound List (TCL) must be  $\geq 0.05$ , and  $\geq 0.01$  for the twenty-two analytes with poor response in both the initial and continuing calibrations. A value  $< 0.05$ , or  $< 0.01$  for the poor performers indicates a serious detection and quantitation problem (poor sensitivity). Analytes detected in the sample will be qualified as estimated, "J". All non-detects for that compound will be rejected "R".

No problems found for this qualification as per NFG/CCS report

**B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):**

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance. Percent RSD must be  $< 20\%$ ,  $< 40\%$  for the poor performers, and  $< 50\%$  for 1,4-Dioxane. %D must be  $< 25\%$ ,  $< 40\%$  for the poor performers, and  $< 50\%$  for 1,4-Dioxane. A value outside of these limits indicates potential detection and

quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and non-detects are flagged "UJ". If %RSD and %D grossly exceed QC criteria (> 90%), non-detects data may be qualified "R".

The following analytes in the sample shown were qualified for %RSD and %D:

The following volatile samples are associated with an initial calibration percent relative standard deviation (%RSD) outside criteria. Detected compounds are qualified J. Non-detected compounds are not qualified.

**Bromomethane** B7PS8, B7PS9, B7PT5, B7PW3, B7PW4, B7PZ1, B7PZ2, B7PZ5, B7PZ6, B7PZ6MS, B7PZ6MSD, B7PZ9, B7Q04, B7Q05, B7Q06, B7Q07, VBLK6D, VBLK6F, VBLK6H, VHBLKOB

#### 8. INTERNAL STANDARDS PERFORMANCE GC/MS:

Internal standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must not vary by more than a factor of 2 (-50% to +200%) from the associated continuing calibration standard. The retention time of the internal standard must not vary more than 30 seconds from the associated continuing calibration standard. If the area count is outside the (-50% to +200%) range of the associated standard, all of the positive results for compounds quantitated using that IS are qualified as estimated, "J", and all non-detects as "UJ", or "R" if there is a severe loss of sensitivity.

If an internal standard retention time varies by more than 30 seconds, the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction.

No problems found for this qualification as per NFG/CCS report

#### 9. COMPOUND IDENTIFICATION:

##### A) Volatile Fraction:

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within 0.06 RRT units of the standard compound and have ion spectra which has a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications.

No problems found for this qualification.

#### 10. CONTRACT PROBLEMS NON-COMPLIANCE:

None

#### 11. FIELD DOCUMENTATION:

**ATTACHMENT 1**  
**SOM01.2/Low/Med**  
**SOP NO. HW-33/VOA, Rev.1**

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No problems found for this qualification.

**12. OTHER PROBLEMS:**

None

**13. This package contains reextractions, reanalyses or dilutions. Upon reviewing the QA results, the following Form 1(s) are identified NOT to be used.**

None